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Index to Volume 7

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INDEX TO VOL. 7

Important Articles, Tables and Diagrams Appearing in Boston Elevated Railway "Co-operation"

Accident data, showing improvements, 75; records, 39
Acetylene operator, 17, 22
Advertisements, reproductions of full-page newspaper, 110, 123
Armature winder, The, 129, 138
Ashmont, rapid transit extended to, 115; terminal from the air, 168; signals and interlocking, 179
Audit Bureau outing, 111; picture, 120
Autographs of 45-year men, 124

Barnum, H. Ware, general counsel, 65, 76
Bauch, C. A., retires, 173
Boiler equipment, pulverized fuel, 19
Boston Elevated Closeups, the substation operator, 1, 11; the acetylene operator, 17, 22; the towerman, 33, 38; the machinist, 49, 60; the executive officers, 65, 76; structural ironworkers, 81, 93; the rapid-transit lines station porter, 97, 108; the cable-testing crew, 113, 121; the armature winder, 129, 138; the last Railway horses, 145, 155
Boston Herald, editorial on the Elevated, 43
Boston Madison Square Garden, progress note, 127
Bowling League scores, 6, 59
Brooks, E. M., lecture on real estate law, 44
Burroughs, Dwight, "Selling Car Rides," 106, 135
Buses (and cars), percentages in service, 7; new electric drive, 73; transport soldiers, 111; mileage, graph showing growth, 101

Cable-testing crew, 113, 121
Cancer control, campaign for, 37
Capital of Boston Elevated, sources of, 73
Cars (and buses), percentages in service, 7
Car, wooden, last one retired, 59
Case of the month, The, 188
Central Square station improvements, 99
Characteristics, changing, of "El" service, 56
Codman Street Yard, 147; from the air, 161, 168, 175
Cody, Wm. F., verses "Grit," 126
Columbia station improvements, 99
Complaints about service and employees, 25
Correspondence course popular, 133
Crane, Dr. Frank, article "Education has no Saturation Point," 143

Dana, Edward, general manager, 65, 76; messages to employees, on reducing delays, 2; on meeting emergencies 18; on salesmanship, 34, 50; on safe operation, 67; on making service attractive, 82; on responsibility for safety, 98; on increasing summer riding, 114; on the 1927-28 educational program, 131; on customer contact, 146; on making service dependable, 162; on making winter riding attractive, 178
Data of Boston Railway, 1920 and 1927 compared, 23; revenue and passengers, 1926-27, 24
Day, Henry S., "Keeping Cars on the Road," 27
Delays to service, reducing, general manager's editorial, 2; lessened, 26; summary by causes, 77
Derailments, committee on, group picture, 58; and split switches, 58
Dorchester Rapid Transit Extension, Harrison substation, 3; extension to Ashmont, 115; view of Ashmont station, 126; automatic substation at Ashmont, 131; picture of Fields Corner station, 142; Codman Street yard, 147; signals and interlocking at Ashmont, 179

Educational calendar, 134, 158, 174, 190; season closes, 37; program, group in attendance at closing exercises, picture, 74; program, closing exercises in, 75; program, seventh, announced, 127; program, general meetings, 175
Education, committee on, 127; group picture, 159
"Education has no saturation point," by Dr. Frank Crane, 143
"Education, Value of," by Dr. Payson Smith, 87
Employment records for 24 years, 29; 1916 to date, 152
Emblems, long-service, 125
"Everyday Economics," by Dean LeRossignol, 62, 78
Everyday law, lecture by C. W. Mulcahy, 12; by J. P. Hughes, 30; by E. M. Brooks, 44; by C. B. Gleason, 54; by M. P. Spillane, 89; by J. E. Hannigan, 139; by A. E. Pinanski, 183
Expenses and revenue for calendar year, 8; for fiscal year, 102;

Fares, facts about, 28; why they differ, 36
Fields Corner garage, 83; station, picture, 142; station and surroundings from the air, 184
Football traffic, handling, 5
"Four C's of a successful New Year," 177, 189
Forbes, B. C., "Why men fail," 172

Garage, new Dorchester, 83
George Street yard, 14
Gleason, C. B., lecture on law of contracts, 54; lecture on law of negotiable instruments, 70
Graves, Dr. R. J., "The Length of your Belt," 126

Hannigan, J. E., "Have you made a will?" 139
Harrison substation, 3
Harvard Square, new headhouse, 67
Health, suggestions for, by Dr. B. E. Sibley, 189
Honor roll of Boston Elevated Railway, 47
Horses, the last Railway, 145, 155; Some faithful horses and their drivers, 154
"How to Study," by Dr. G. F. Swain, 150, 170,
Hungerford, J. E., verses "Teamwork," 88; "Don't Trouble Trouble," 182
Hughes, J. P., lecture on criminal law, 30

Industries, America's twenty leading, 127
Inspector, the rapid-transit lines, 69
Interlocking and signals at Ashmont, 179
Investment, rapid-transit requires large, 186

"Keeping cars on the road," by Henry S. Day, 27

Law, constitutional, lecture by C. W. Mulcahy, 12; criminal, lecture by J. P. Hughes, 30; real estate, lecture by E. M. Brooks, 44; of contracts, lecture by C. B. Gleason, 54; of negotiable instruments, lecture by C. B. Gleason, 70; administration of, lecture by A. E. Pinanski, 183; course, outline of, 159
Leaks, chart showing seriousness of, 77
"Length of your belt, The," by Dr. R. J. Graves, 126
Life saved by "El" bridgeman, 175
Long-service men honored, 46
Maccoy, Margaret L., verses, "Amelia's Friendship Flight," 111

Machinist, The, 49, 60
Maintenance costs of Elevated, 72; department closing exercises, with picture, 88
Moran, J. H., general auditor, 65, 76
Mulcahy, C. W., lecture on constitutional law, 12

Neal, Henry V., verses, "Wheels of Time," 108
Night-car service, 125
North Station changes, 157; new "El" developments at, 163
Nursing and first-aid course announced 182
Nurse, visiting, 103

Payroll, employees on Boston Elevated, 152
Pension list, additions to, 109
Pinanski, A. E., lecture on administration of the law, 183
Plant improvements under trustee control, 40
Porter, the rapid-transit lines station, 97, 108
Power, maximum, used in each year, graph, 57; supply, The reliability of, 6
Powers, L. G., rescues man at Malden bridge, 175
Praise for "El" practices, 138
Prosecutions for misuse of transfers, 104
Public-speaking class holds farewell dinner, 59; course, 155
Pulverized fuel equipment at South Boston, 19

Radio talks over WEEI, 182
Rapid-transit lines, snow-fighting on, 35
Rapid transit requires large investment, 186
Revenue and expenses for calendar year, 8; for fiscal year, 102
Reserve fund data, 16, 32, 48, 64, 80, 96, 112, 128, 144, 160, 176, 192
Revenue passengers, average weekday, graph, 56
Riding habit, as affected by automobiles and fares, 122
Rolling-stock changes in a decade, 7
Rule-book, New rapid-transit, 157

Safety, Notes on, 142
Sawyer, W. H., speaker at general meeting, 24, 41
Scollay Square, new headhouse, 67
Sears, Russell A., general attorney, 65, 76
"Selling Car Rides," by Dwight Burroughs, 106, 135
Service, cost of, graph, 103
Service delays, cutting down, 15; in cold weather, 15
Service long recognized, 125
Shawmut station, view of, 126
Sibley, Dr. B. E., "Suggestions for Health" 189
Signals and interlocking at Ashmont, 179
Smith, Dr. Payson, speaker at closing exercises, 75; address, "Seven Things that an Education should do," 87
Snow-fighting on rapid-transit lines, 35
Spillane, M. P., lecture on torts or civil wrongs, 89
Storrs, L. S., speaker at general meeting, 175
St. Clair, Labert, addresses Supervisors' Association, 28
Structural ironworkers, 81, 93
Substation operator, The, 1, 11
Substation, automatic, at Ashmont, 131
Suggestions for improvement invited, 111, 173
Supervisors' Association, 14, 28; group picture of board of control, 41; closing meeting, officers elected, 76; appointments, 101; announcement of program, 133; opens second season, 156; group picture of board of control, 156; second meeting, 175; record meeting, 191
Swain, Dr. G. F., "How to Study," 150, 170

"Televox" demonstrated, 191
"Torts or Civil Wrongs," lecture by M. P. Spillane, 89
Towerman, The, 33, 38
Track reconstruction, Highland Ave., Somerville, 51
Traffic regulations, "G. O. 182," 167
Transfers, Prosecutions for misuse of, 104
Transportation department superintendents, group picture, 61
Trolley breaks, 26
Trustees of the Boston Elevated Railway, group picture, 10
Wensley, R. J., demonstrates "Televox," 191
"What do you know about the 'El'?" 12
Whiting, E. E., speaker at maintenance banquet, 88
"Why Men Fail," by B. C. Forbes, 172
Willett, D. H., verses, "Outing," 111; "Bird Memories," 189
Wills, "Have You Made One?" lecture by J. E. Hannigan, 139
Wilson, H. L., treasurer, 65, 76
Verses by J. E. Hungerford, 88, 182; by Henry V. Neal, 108; by Margaret L. Maccoy, 111; by D. H. Willett, 111, 189; by Wm. F. Cody, 126

Boston Elevated Railway

CO-OPERATION

Volume 7 JANUARY, 1928 Number 1

Boston Elevated Close-Ups

THE SUBSTATION OPERATOR

(See Page 11)

To All 'El' Employees

NINETEEN TWENTY-SEVEN was a good year in regard to delays to service as measured by delays of twenty minutes' duration or more. It was the best record that we have had for seven years. This was particularly creditable in view of the fact that the number of vehicles using the highways shows a substantial annual increase.

This achievement spurs us to do still better in 1928.

Delays are divided into two classes—those for which we are responsible and those for which we are not responsible.

Those for which we are responsible, caused by faulty operation, maintenance and construction, poor handling of conditions, etc., can be reduced by more careful operation, inspection and maintenance.

While delays due to causes beyond our control cannot be prevented, the duration of such delays may sometimes be reduced and serious inconvenience to our patrons avoided. Quick thinking and efficient action will do this.

Data regarding causes of delays of twenty minutes or longer are given in an article elsewhere in this issue. We can all study this information with profit.

Edward Dana

POWER FOR DORCHESTER RAPID-TRANSIT EXTENSION

Near Fields Corner Station Is Located an Up-to-the-Minute Automatic Substation Which Supplies Power for Local Surface Lines as Well as Rapid Transit

An important feature of the Dorchester rapid-transit development, not covered in previous articles in "Co-operation" on this subject, is the Harrison substation. This is located on Dickens street, near Fields Corner station. It not only furnishes power for the rapid-transit lines but for the surface cars in this district as well. It is an automatically operated and supervised substation, its operation being similar to that of the Oak Square substation on Washington street, Brighton, described in the April, 1926, issue of "Co-operation."

The equipment of this substation comprises two 3,000-kilowatt shunt-wound converter units with outdoor oil-cooled transformers. Most of the apparatus is pictured in the accompanying illustrations. Alternating-current power is transmitted to this substation through two 13,200-volt alternating-current 3-phase cables from the South Boston power station. Two other alternating-current cables, of smaller capacity, which will be used in emergency, are connected to this substation through the Egleston substation on Washington street, near Egleston Square, Roxbury.

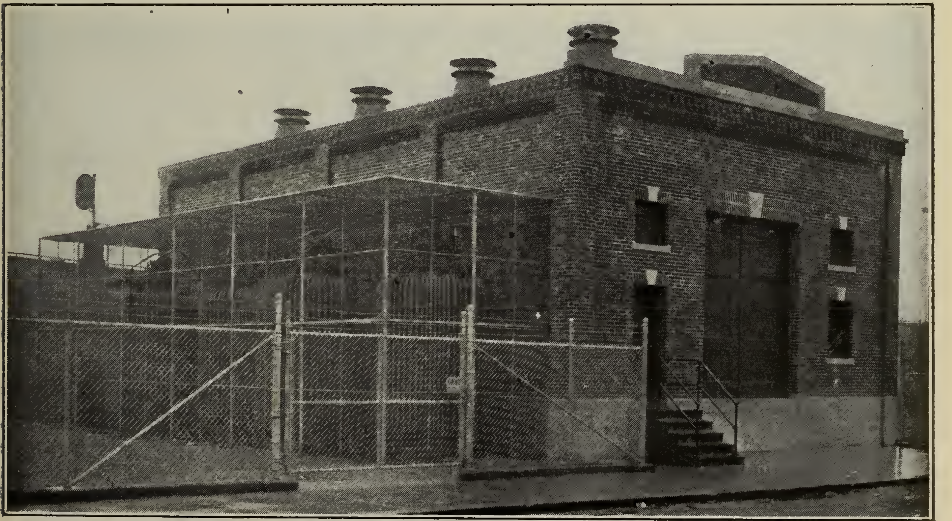
The high-tension power furnished to this substation, after conversion to 600 volts direct current, is distributed to the trolley wire of the surface lines in this district, as well as to the third rail of the rapid-transit lines, through eleven 1,000,000-circ. mil and seven 2,000,000-circ. mil cables.

The outdoor oil-cooled transformers, of which there are six, of the single-phase type, transform the 13,200-volt high-tension current to 440 volts for supply to the converters.

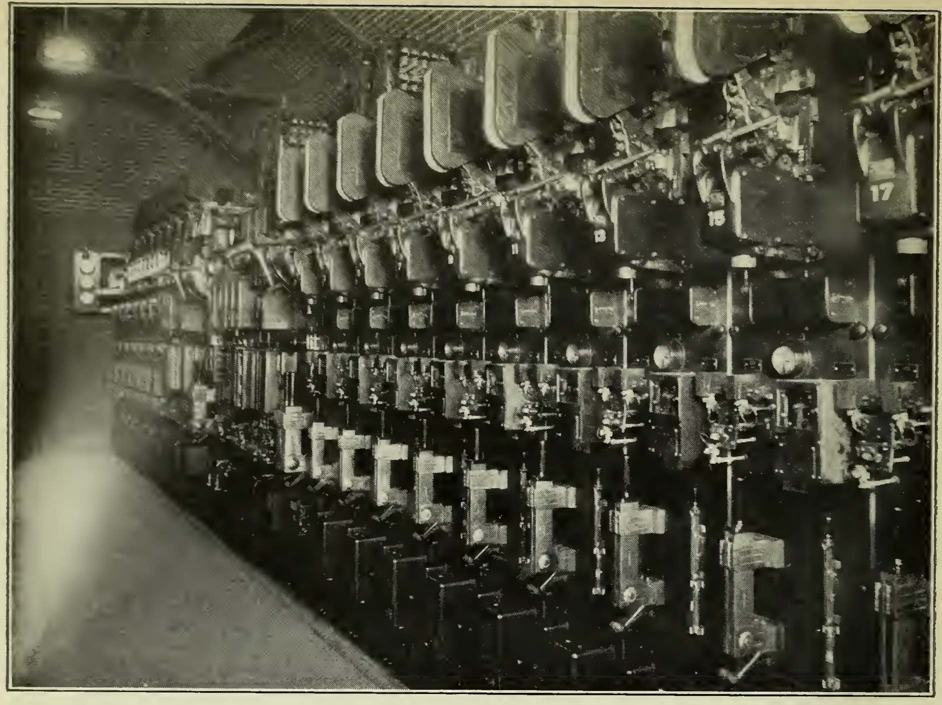
With the cutting over of the surface line feeders in this district to the new substation, the abandonment of the manually operated rotary-converter equipment in the Dorchester power station on Freeport street was made possible and the substation equipment made available for transfer to other locations.

An excellent description of this substation was given before the New England Street Railway Club on Oct. 27, 1927, by F. N. Carothers, general foreman of substations of the Railway. This appeared in the Street Railway Bulletin for October, 1927, page 390. He explained, among other technical details, that either converter in this substation can be made the leading or trailing unit by throwing a hand-operated switch. The converters can be started and stopped by means of the supervisory system, but it is the practice to allow them to come into action and go out of action in accordance with the load demand. In case of failure of the leading unit to go into service the trailing one, after a short timing period, goes into service and through the supervisory control the system operator is notified

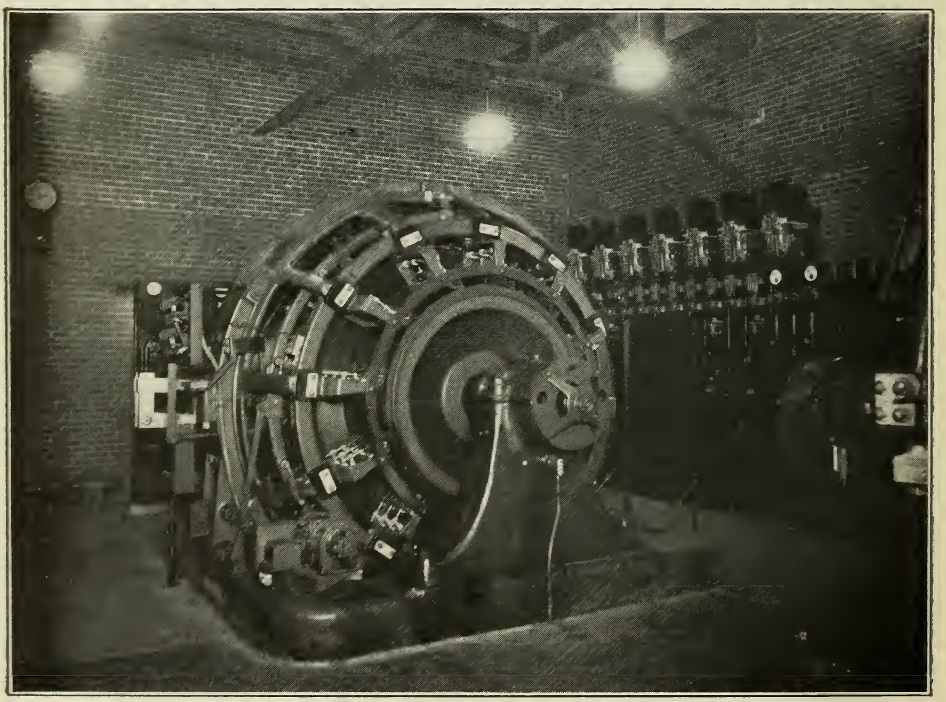
(*Please turn to page 5*)



GENERAL VIEW OF HARRISON SUBSTATION
(Rapid-transit track and signal in background)



SWITCHBOARD AT HARRISON SUBSTATION, WITH AUTOMATIC CONTROL EQUIPMENT



ONE OF THE 3,000-K.W. ROTARY CONVERTERS IN HARRISON SUBSTATION

(Concluded from page 3)

that the leading unit has failed. In case of failure of the automatic control equipment the station can be changed over for manual operation almost instantaneously.

There is a full equipment of circuit breakers to prevent overload on the direct-current side of the machines and also load-limiting resisters, located in the basement, which hold them to their commutating capacity even if the direct-current bus should be grounded.

The Supervisory System

Reference has been made to the supervisory control, regarding which a few additional details may be of interest. Four telephone wires, rented from the telephone company, connect the substation with the system operator's office. One wire is used for operation, one for indication to the system operator of the condition of the equipment, one for the synchronizing of the distributors, explained below, and the fourth is a common return wire for the other three.

The distributors consist of rotary switches, operating at the same speed, by means of which different circuits in the substation control system are connected to the control wires in rapid succession. By this means the same control wires from the system operator's office to the substation can be used to control many different parts of the equipment. Obviously these switches must rotate at exactly the same speed, hence the special synchronizing wire to connect the distributor in the operator's office with the distributor in the substation. The system operator can control as many operations as desired, either opening, closing, or both, at the same time. After an operation, indication is given in his office in five seconds. The position of all pieces of apparatus is checked at five-second intervals. Watthour-meter readings on both converters and on the rapid-transit feeders are transmitted to the system operator's office over this supervisory.

HOW FOOTBALL TRAFFIC IS HANDLED

During the football season recently closed there were seven games played at the Harvard Stadium. The estimated attendance at these games totaled 288,000 persons. Of these slightly more than 54,000 were admitted to the Stadium Station of the rapid-transit lines after the games.

The following table gives details regarding the games:

		Estimated Attendance	No. admitted Stadium Sta. After Game
Oct. 1	Vermont	25,000	2,704
Oct. 8	Purdue	30,000	4,615
Oct. 15	Holy Cross	45,000	8,432
Oct. 22	Dartmouth	54,000	11,711
Oct. 29	Indiana	35,000	6,872
Nov. 12	Brown	45,000	8,592
Nov. 19	Yale	54,000	11,077

To facilitate the handling of this traffic the platform on the Boylston street side of the Eliot square yard, known as Stadium station, was opened on the days of the games and the Cambridge-Dorchester train service was extended to the Stadium for about two hours while people were going to the game and again for about one hour when they were going away from the game. The football patrons were thus carried in addition to the regular Cambridge subway riders.

The trains at these times were oper-

OUTDOOR TRANSFORMERS AT HARRISON SUBSTATION
(Dickens Street at right, rapid-transit track at left)

ated on a 2-minute headway, and during the height of the outgoing riding the loads have reached about 300 persons to the car or 1200 to the 4-car train. This is the equivalent of about 600 persons per minute.

The total shows that about 20 per cent of the persons attending the games patronized the trains at the convenient Stadium station. Another 10 per cent boarded trains at Harvard station and probably still another 10 per cent patronized surface lines in Cambridge and Allston. Slightly more than one-half used automobiles or walked, and the number going by means other than Boston Elevated cars appears to be increasing year by year in about the same ratio as the seating capacity of the Stadium bowl is increasing. Thus in 1912, when the seating capacity of the bowl was about 35,000, the largest game produced about 12,000 riders at Stadium station, approximately the same as today.

At Stadium station, at times of large games, the fares are collected in four station fare boxes at the main entrances and two at the side entrances. A corresponding number of fare box attendants and change-makers are employed.

BOWLING LEAGUE SCORES

BOSTON ELEVATED

	Won	Lost	Pinfall
Rapid Transit Lines	47	13	21285
Rolling Stock & Shops	45	15	21646
Repairmen	38	22	20956
Division One	36	24	20967
Division Two	36	24	20946
General Managers	36	24	20612
Division Three	34	26	20828
South Boston Power	30	30	20714
Sullivan Square	30	30	20441
Division Four	28	32	20088
Automotive Equipment	20	40	19806
Receiving Department	17	43	19629
Everett Shops	16	44	19646
Supervisors	7	53	19216
High single string. Downey			127
High three strings. Downey			325
High team single string. R. S. & S.			531
High team three strings. R. S. & S.			1514

RAPID TRANSIT

	Won	Lost	Pinfall
Newman	39	17	18753
Power	38	18	18792
Thomas	35	21	18711
Sprague	33	23	18389
Perron	28	28	18125
McCrystal	23	33	17899
Butler	18	38	17812
Hirsch	10	46	17545
High single string. Kelly			122
High three strings. Kelly			296
High team single string. Newman			470
High team three strings, Power			1334

THE RELIABILITY OF THE "EL" POWER SUPPLY

In the issue of "Co-operation" for August, 1926, an article was printed under the caption "Elevated Has Reliable Power Supply," which conclusively proved this reliability. It was shown that the power supply was 99.99 per cent reliable over the entire period of trustee operation.

Since that article was printed there have been two power failures affecting the system, as follows:

On June 25, 1927, a high-tension power cable feeder caused the loss of power on the system of from two to six minutes.

On August 16, 1926, power was off a part of the system from two to eleven minutes.

These interruptions were negligible when considered in relation to the extent of the generating and distribution system, some details of which follow:

In this system there is involved a total of about seven thousand tons of copper. Power is distributed through 150 miles of underground cable, and it is transformed from alternating current to direct current in seventeen substations.

From the above substations there are seventy-four feeder sections for the surface lines, twenty-four sections for the rapid transit lines, and twenty-four sections for the subways, to which power is distributed through 863 miles of feeder and return copper.

To put the reliability record into the form shown in the earlier article, the following summary has been prepared:

Since July 1. 1918, when the public trustees of the Elevated assumed responsibility for the operation of this great system, until Dec. 1. 1927, over 4,876,960 minutes have ticked away. In this period there have been only thirty-eight instances of temporary power defects, totaling three hundred and eighty minutes.

The total of delays, due to power defects, is less than 8/1000 of 1 per cent.

"I am the foundation of all business. I am the fount of all prosperity. I am the parent of genius. I am the salt that gives life its savor. I can do more to advance a youth than his own parents, be they ever so rich. Fools hate me; wise men love me. Who and what am I? I am Work."—*Exchange.*

CHANGES IN "EL" ROLLING-STOCK IN A DECADE

Percentages refer to service rendered by the different types of vehicles. Rapid transit is included.

25-ft. Box

1918	26.5%
1927	0.4%

26½-ft. Box

1918	3.4%
1927	0.4%

Articulated

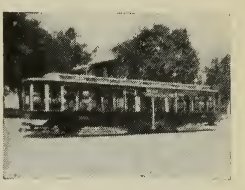
1918	9.7%
1927	——

Nos. 1, 2 and 3 "Semi"

1918	6.6%
1927	1.5%

No. 4 "Semi"

1918	19.4%
1927	9.1%



Trailers

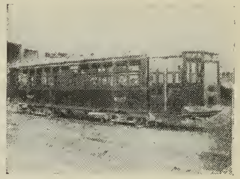
1918	3.2%
1927	4.4%

Center-entrance

1918	3.9%
1927	18.3%

Birney Safety

1918	——
1927	0.4%



No. 5 "Semi"

1918	——
1927	29.0%

Motor Buses

1918	——
1927	9.7%

Rapid Transit

1918 25%	1927 26.3%

Foreign Cars

1918 2.3%	1927 0.5%

The above for each year total 100 per cent.

The above table is a revision of the one appearing in the October, 1926, issue of "Co-operation." It does not include the new Cambridge subway cars, which will be included in the next tabulation.

REVENUE AND EXPENSES—Y

1910 -

	1910	1911	1912
Total Revenue	$15,630,562	$16,404,294	$16,400,085
Railway Operating Expenses:			
Way and Structures (Maintenance)	1,459,827	1,383,676	1,849,877
Removal of Snow and Ice	113,400	34,340	66,461
Equipment (Maintenance)	1,063,848	1,044,806	1,306,922
Power (Operating)	1,147,913	1,193,354	1,136,979
Power (Maintenance)	159,592	180,404	180,891
Transportation (Operating)	4,495,871	4,337,458	5,448,644
Traffic (Operating)	80,238	49,588	22,558
General and miscellaneous	1,747,487	1,594,578	1,900,352
Depreciation	....	....	....
Total	$10,268,176	$9,818,204	$11,912,684

	Per cent of revenue	Per cent of revenue	Per cent of revenue
General and miscellaneous	11.18	9.72	11.59
Operating	36.62	34.02	40.29
Maintenance	17.17	15.90	20.35
Depreciation	....	....	....
Removal of Snow and Ice	.72	.21	.41
Operating ratio	65.69	59.85	72.64

1919 -

	1919	1920	1921
Total Revenue	$29,498,583	$34,031,636	$33,277,026
Railway Operating Expenses:			
Way and Structures (Maintenance)	3,721,965	2,593,726	2,683,384
Removal of Snow and Ice	18,550	615,549	63,460
Equipment (Maintenance)	2,585,720	3,011,850	2,741,357
Power (Operating)	2,385,597	3,135,296	2,183,737
Power (Maintenance)	338,582	468,696	348,764
Transportation (Operating)	10,530,882	11,524,823	10,752,383
Traffic (Operating)	4,758	3,358	2,401
General and miscellaneous	2,110,285	2,411,824	2,063,571
Depreciation	2,004,000	2,004,000	2,004,000
Total	$23,700,339	$25,769,122	$22,843,057

	Per cent of revenue	Per cent of revenue	Per cent of revenue
General and miscellaneous	7.15	7.09	6.20
Operating	43.80	43.09	38.88
Maintenance	22.53	17.85	17.35
Depreciation	6.79	5.89	6.02
Removal of Snow and Ice	.07	1.81	.19
Operating ratio	80.34	75.73	68.64

ARS ENDING DECEMBER 31.

918

1913	1914	1915	1916	1917	1918
$17,510,545	$17,910,176	$18,171,655	$19,376,357	$19,818,407	$21,062,693
1,540,548	1,531,835	1,390,311	1,433,870	1,611,097	2,235.018
9,974	94,540	54,153	167,418	87,078	77,914
1,184,073	1,225,511	1,105,723	1,292,899	1,489,863	2,077,699
1,117,762	1,211,790	1,109,113	1,116,077	1,415,782	2,238,737
130,619	150,125	105,856	142,685	146,158	305.629
4,952,320	5,659,147	5,699,670	6,253,508	6,522,360	7,772,434
13,301	8,910	9,921	22,911	6,405	9.167
1,716,718	1,700,976	1,815,990	1,904,754	1,948,381	2,094,829
....	....	142,990	320,000	320,000	1,184,670
$10,665,315	$11,582,834	$11,433,727	$12,654,122	$13,547,124	$17,996,097
Per cent of revenue	Per cent of revenue	Per cent of revenue	Per cent of revenue	Per cent of revenue	Per cent of revenue
9.80	9.50	9.99	9.83	9.83	9.95
34.74	38.41	37.52	38.15	40.09	47.57
16.31	16.22	14.32	14.81	16.38	21.93
....	....	.79	1.65	1.61	5.62
.05	.54	.30	.86	.44	.37
60.90	64.67	62.92	65.30	68.35	85.44

1927

1922	1923	1924	1925	1926	1927
$32,699,176	$34,096,813	$34,175,320	$34,547,380	$35,481,313	$35,193,410
2,611,362	2,955,690	2,836,772	2,865,886	2,764,921	2,610,830
103,291	312,987	112,752	102,010	484,165	154,856
2,551,681	2,665,532	3,033,022	2,752,796	3,054,504	2,868,226
2,302,763	2,342,042	1,991,328	1,720,239	1,826,409	1,755,115
357,956	351,889	328,756	266,770	316,166	335,862
10,040,832	10,905,933	11,825,235	11,567,233	11,924,518	11,436,060
3,033	3,364	7,866	3,240	6,139	31,862
2,113,541	2,588,816	2,590,403	2,631,562	2,857,724	3,115,301
2,004,000	2,004,000	2,496,000	2,496,000	2,841,722	2,824,220
$22,088,459	$24,130,253	$25,222,134	$24,405,736	$26,076,268	$25,132,332
Per cent of revenue	Per cent of revenue	Per cent of revenue	Per cent of revenue	Per cent of revenue	Per cent of revenue
6.46	7.59	7.58	7.62	8.05	8.85
37.76	38.86	40.45	38.47	38.77	37.57
16.88	17.52	18.13	17.04	17.29	16.52
6.13	5.88	7.31	7.22	8.01	8.03
.32	.92	.32	.29	1.37	.44
67.55	70.77	73.79	70.64	73.49	71.41

PUBLIC TRUSTEES OF THE BOSTON ELEVATED RAILWAY

Left to right—Winthrop Coffin (Apptd. Feb. 15, 1919); Stanley R. Miller (July 1, 1918); Samuel L. Powers, Chairman (Oct. 28, 1918); J. Frank O'Hare (June 1, 1922); Edward E. Whiting (Sept. 21, 1927).

ELEVATED CLOSE-UPS

The Substation Operator

(See illustration on front cover)

ON the front cover of this issue is shown a substation operator in the act of closing the main switch of a rotary converter in a manually operated substation. This is the last operation preliminary to putting the converter on the line.

The duties of a substation operator consist in starting and stopping equipment, the close observation of instruments which advise him of load conditions and the keeping of equipment clean and in good condition. The putting into service of the first machine in a substation is governed by voltage conditions and that of the second, or subsequent machines, by the load on the first machine. The sequence of operations in putting the rotary converter on the line is as follows:

1. Close starting switch, connecting converter to starting taps of transformer.
2. Connect voltmeter on switchboard to machine by plug.
3. Close high-tension oil switch by operation of pull-button on switchboard. This action connects transformers to high-tension power.
4. When machine has reached synchronous speed, close field switch at proper time as indicated by voltmeter.
5. Change starting switch from starting taps to running taps on transformers.
6. Lower brushes to commutator.
7. Close negative and equalizer switch.
8. Start blower used for circulating air through coils of transformer.
9. Adjust rheostat to meet voltage conditions, then close direct-current circuit-breaker and positive switch successively on switchboard. This latter action is shown in picture on front cover of this issue. Machine is now connected to direct-current bus and is supplying power to car service.

The railway operates nine manually controlled substations similar to that at Washington Village (where the "close-up" was taken), and two automatically controlled substations, similar to that at Oak Square, Brighton, described in the April, 1926, issue of "Co-operation," partially to meet the demands of the power system. Rotary-converter capacity is also installed in the Central, Lincoln, Charlestown and Harvard power stations.

The Railway operates forty rotary converters, varying from 1,000 to 3,000 kilowatts capacity each, in its several steam power stations and its substations.

The total rated capacity of all the rotary-converter equipment is 85,000 kilowatts. Through this equipment the 25-cycle, 13,200-volt, high-tension current supplied from the alternating-current generators installed at South Boston and Lincoln power stations is converted to 600-volt direct current for car operation.

WHAT DO YOU KNOW ABOUT THE "EL"?

ANSWERS TO LAST MONTH'S QUESTIONS

66. As of Dec. 31, 1926, what was the permanent investment in the "El" per dollar of annual total income?

    Ans. $4.481. (See annual report of the public trustees for the year ended Dec. 31, 1926, p. 30.)

67. Of the nearly four million dollars advanced to the "El" by the cities and towns in 1919 how much had been repaid to and including July, 1926?

    Ans. $1,674,640.06. (See trustees' report, p. 34.)

68. To and including 1926, how much money did the City of Boston invest in the "El"?

    Ans. $46,591,700. (See "Co-operation," June, 1927, p. 89.)

69. How many new blue-uniformed men were employed by the Railway in 1926?

    Ans. Fifty-five. (See "Co-operation," April, 1927, p. 61.)

70. What is the estimate of cost of the new Ashmont station, inclusive of real estate, but exclusive of equipment?

    Ans. $752,000. (See "Co-operation," March, 1927, p. 36.)

OUR PER CAPITA RESOURCES

In 1870 the money value of the economic goods possessed by the people of the United States (not including the outlying possessions or territories) was about $30,000,000,000. The population was then, roughly, 38,500,000, so that the per capita wealth was about $780. This is for each man, woman and child in the country. In 1922 the population may be estimated at 113,000,000. (It was 105,710,620 by the census of 1920.) The wealth had grown to posibly $325,000,000,000. This is $3,000 per capita, an increase of $2,200 in fifty-two years, or 282 per cent.

CONSTITUTIONAL LAW*

The Speaker Discussed Structure of Government, Explained the Differences Between State and Federal Governments, Outlined the Powers of Legislature and Congress and Showed How Rights Are Safeguarded by the Constitution

By CHARLES W. MULCAHY, ESQ.
Attorney at Law, Boston, Mass.

IN order to visualize the circumstances under which our constitution was adopted let us go back 150 years, to the close of the War of the Revolution. The former colonies of Great Britain were then free and independent states, not bound together except very loosely. Each state was a law unto itself. The result was a chaotic condition. Some of the states were trying to further their own independent interests at the expense of the others as by discriminating against articles brought in from other states. Each state issued its own paper money.

The greater minds of the period saw clearly that there must be some union, some federation of states. This involved a surrender to a central authority of their independence, hence there was great opposition from states which had just thrown off an oppressive government. No less a personage than Patrick Henry was a bitter opponent to the ratification of the federal constitution.

The lack of adequate means of communication between parts of the country interfered with an understanding of the problem, but finally the better thought of the people prevailed and the federal constitution was adopted by a very close margin.

The constitution was in effect an agreement, among the several states which were partners in the new venture, that they would give to the federal government exclusive power over certain matters.

In general, the matters over which the states granted power to the federal government were those of common concern, i. e., national defence, the raising and supporting of an army and navy, the coinage of money, naturalization, bankruptcy and the regulation of interstate and foreign commerce.

It should be remembered that the several states composing the Union had adopted their own constitutions before the federal constitution was adopted. The states had inherent power, all the power of a sovereign people. When they delegated some powers to the federal government, what was not expressly delegated remained in them. The state constitutions, in somewhat similar manner, gave to the state governments powers which the people surrendered to the state legislature and officers.

The fundamental idea of a democratic form of government is that the people themselves are sovereign and that all governments derive their authority from the consent of the governed. When the people gave the state government certain powers, by their constitution, they reserved certain rights to themselves which the legislature could not infringe.

Both the federal and state constitutions create a framework of government comprising legislative, executive and judicial branches. Each contains also a bill of rights, which is for the protection of the individual. This includes the right of trial by jury in controversies concerning property and in criminal causes; the guarantee that no man's property shall be taken without due process of law; protection from unreasonable searches; the right of religious liberty and property rights. The bill of rights is essentially a guarantee of protection to the minority.

AMENDMENTS TO THE FEDERAL CONSTITUTION

After the Civil War had decided the issue of slavery, the so-called "war amendments," the thirteenth, fourteenth and fifteenth, were adopted. They provide that all persons born in the United States shall be citizens of the United States and of the state in which they were born; that no state shall deprive any person of the privileges and immunities of a citizen of the United States, and that no person's property shall be taken from him without due process of law. The right of each citizen to vote, regardless of race, color or previous condition of servitude is also guaranteed.

CONSTITUTIONALITY OF A LAW

If a law violates the constitution it is obviously invalid, but who determines whether or not it is invalid? This question aroused great controversy but it was finally settled that this is a judicial question which the courts may pass upon in all proper cases.

POWERS OF THE STATE

The three great powers possessed by the state are taxation, eminent domain and the police power.

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*Abstract of third lecture in course in Everyday Law, E. M. Brooks, chairman, delivered at Franklin Union and Sullivan Square, Monday, December 5, 1927.

Taxation must be for a public purpose. Thus, the constitutionality of the Boston Elevated Railway Public Control Act was attacked upon the ground that it contained provisions for taxation in certain cases where the income of the road was not sufficient to provide the cost of service, and it was claimed that this was not a public purpose. It was ruled, however, that the operation of a street-railway system in this great metropolitan area was a public purpose, something in which the public was vitally interested.

Taxation also must be uniform, but this permits different rates of tax on different amounts, say of income or inheritance, provided that all persons are taxed on the same basis.

There are other limitations on the power of the government to tax. For example, the federal government cannot tax a state, or, generally speaking, an agency of a state, and vice versa.

The power of eminent domain, or taking property by condemnation proceedings, can also be exercised only for a public purpose. Reasonable compensation must be paid for property taken under this power.

The police power is that under which the state regulates in general the affairs of its citizens and makes laws for the protection of health, safety and morals. It can only be exercised when it has a reasonable relation to these or, in a limited sense, the public welfare. This power results from the fact that the fundamental purpose of government is to protect its citizens, to promote the general safety, comfort, health and welfare of the body politic. If it is necessary to take away some liberties or rights of an individual citizen the state has a right to do it in the interest of the whole. For example, under the police power a state can require a citizen to submit to vaccination, and it can regulate the hours of labor of women and children or of persons engaged in certain occupations where their health or the safety of the public may be affected by excessive hours of labor. This is in the interest of public health and safety. It would not, however, be constitutional to restrict the hours of employment of all persons regardless of the occupations in which they are engaged, as this would be an unwarranted infringement of the individual's liberty to contract.

It is under the police power that the government regulates rates for public service. The owners of public utilities have a right to a fair return on their investment but can be prevented from charging excessive rates. This is not true in a business not affected with a public interest.

Interstate and foreign commerce is regulated exclusively by the federal government. A state has no control, for example, over a bus line doing an interstate business, but can prevent it from doing an intrastate business.

One limitation to the exercise of the police power is that laws passed under that power may not be discriminatory; all persons in the same situation must be treated alike. Reasonable classifications can be made, but not arbitrary discriminations.

MR. MULCAHY'S ANSWERS TO QUESTIONS

After his address Mr. Mulcahy answered a number of questions, among them the following:

Q. Is not the Attorney-General of Massachusetts sometimes called upon to say whether or not a law passed by the Legislature is constitutional?

A. The Legislature or any official of the State may ask the Attorney-General for his opinion upon the constitutionality of a law, but his opinion is given as such, it has no effect upon the law. It does not have the effect of a decision by the court.

Q. Did I understand you to say that the federal government levies all direct taxes?

A. No. I said that the power of the federal government to levy direct taxes is limited by the requirement in the constitution that they must be apportioned among the states according to their population. Of course, the states also levy direct taxes.

Q. And they have that authority?

A. Yes.

Q. Where do they get it?

A. Under their general power to levy taxes. The only requirement is that the taxes must be reasonable and proportion.

Q. Is there any limit in the placing of taxation on property as to the amount of valuation?

A. The statute requires property to be valued at its fair cash value, although this is not always followed.

"CO-OPERATION"

A title page and an index have been prepared for the 1927 volume (Vol. 6) of "Co-operation" for the convenience of Boston Elevated men and women who are preserving their files. Copies will be sent in response to requests sent to the general manager's office.

JANUARY, 1927, ISSUE SCARCE

The issue of "Co-operation" for January, 1927, is entirely out of print. Copies that can be spared will be appreciated to assist in the completion of files. Please send them to the general manager's office.

SUPERVISORS HOLD FOURTH MEETING

Enthusiasm and genuine interest marked the meeting of the Boston Elevated Railway Supervisors' Association held on Jan. 18. The Association slogan, "Get Acquainted," was applied in a real effort of each man to meet at least five others whom he did not previously know. Each man was tagged with a neatly lettered label which awaited him on a tag-board as he entered the instruction schoolroom. More than a hundred new members were enrolled at the meeting, which was attended by over three hundred men.

The speaker at the meeting was Guy C. Hecker, special engineer American Electric Railway Association, New York. He spoke on "Some Supervisors I Have Met," especially stressing the value of wide personal acquaintance. He illustrated the fact that some excellent people are misunderstood and sometimes maligned simply because they are not personally known. The special slogan for the evening, in line with Mr. Hecker's remarks, was: "If you would have friends, be friendly!"

Following the serious part of the program an excellent vaudeville program was presented, featuring novel musical instruments, and interesting and amusing solos and stories.

The next meeting of the Association will be combined with the general manager's general meeting for all employees, an announcement of which appears in the next column. All present and prospective members of the Association are urged to attend this meeting. The period for charter membership enrollment has been extended to Feb. 15.

NOTED RAILWAY MAN COMING

On Wednesday, Feb. 15, at the instruction school, Sullivan Square, will occur the midwinter general meeting of Boston Elevated Railway employees. All men and women connected with the railway are invited to attend this meeting, which will be under the chairmanship of the general manager. The speaker at the meeting will be L. S. Storrs, managing director American Electric Railway Association and formerly president of the Connecticut Company. Mr. Storrs will speak on the topic, "What Makes Local Transportation Successful?"

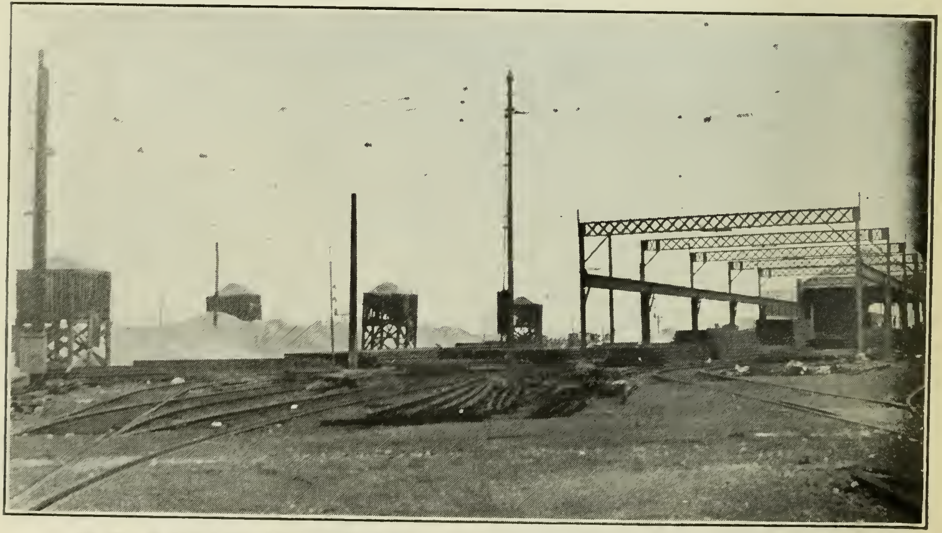
The speaker will discuss some of the important things that are going on in the electric railway field and will give his audience the benefit of his wide knowledge and observation. There will be interesting entertainment features also in connection with the program.

The Board of Control of the Boston Elevated Railway Supervisors' Association has voted to combine its February meeting with this meeting.

MORE ABOUT THE GEORGE STREET YARD

On account of space limitations it was necessary to omit from the September issue of "Co-operation" an interesting view of the rail storage and surroundings in the George Street yard. It is reproduced this month.

The rail storage has a capacity of from 5,000 to 7,000 tons. The picture is particularly interesting because it shows the elevated bins for crushed stone which are located alongside the storage pile, also shown in the picture. The pile has a capacity of from 7,000 to



RAIL STORAGE AND CRUSHED STONE BINS, GEORGE STREET YARD

SUMMARY BY CAUSES OF DELAYS OF 20 MINUTES OR LONGER

	1921	1922	1923	1924	1925	1926	1927
Vehicles broken down or stalled on track	250	245	528	189	183	314	123
Defective cars or equipment	195	224	242	141	135	148	96
Derailments	188	194	218	151	94	109	83
Fire	71	75	122	112	112	127	76
Collisions	64	56	72	71	58	60	64
Wire breaks or power failure	58	58	86	59	43	60	27
Parades or traffic	24	24	39	22	29	17	15
Bridges open	19	15	14	10	5	8	8
Water breaks cr water on tracks	12	2	9	11	3	1	4
Fatal accidents	4	0	1	2	3	1	2
Loss of schedule trips	0	1	0	0	0	0	2
Total	885	894	1331	768	665	845	500

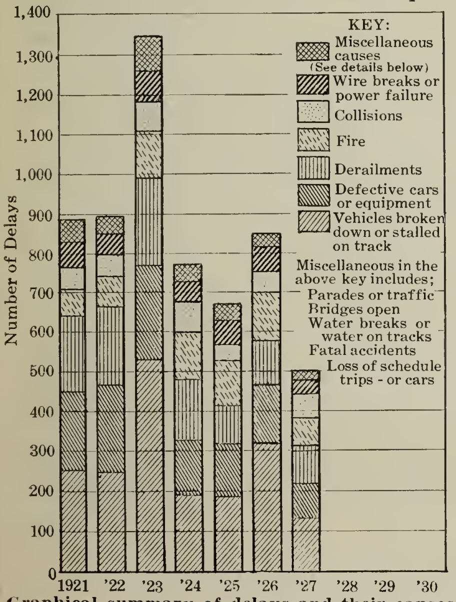
10,000 tons of crushed stone which, as explained previously, is kept in this yard as an insurance against the non-receipt of this material from contractors during the busy season.

The elevated bins hold approximately 225 tons each and are used for quick loading of dump cars.

CUTTING DOWN SERVICE DELAYS

The accompanying table shows the causes of delays in service on the Boston Elevated Railway property, amounting to 20 minutes or more, covering a period of seven years. The improvement shown by the figures is encouraging but there is room for still further improvement. In this the co-operation of all employees is necessary.

The table brings out clearly the effects of weather conditions, especially on the blocking of traffic by vehicles stalled on the track. Snow is the primary cause of large numbers of delays. For example, in 1923 the total fall for January, February and March was 53 inches as compared with the normal fall of 31.7 inches. The result was more than to double the delays due to vehicles broken down or stalled on the track. Snow produces a marked effect on derailments, and in 1923 there were two and a half times as many delays due to defective cars or equipment than in 1927.



Graphical summary of delays and their causes

It is interesting to note for comparison with the 1928 records, when available, that the snowfall for January, 1923, was 28 inches (normal 11.7 inches), that for February was 14.4 inches (normal 12.1 inches) and that for March was 10.6 inches (normal 7.9 inches).

Of the several causes of service delays, some are beyond the control of the Railway, in fact nearly 48 per cent are so. However, even in such cases Railway employees can often assist in removing obstacles, thus reducing the delay period.

Of the causes under control, defective cars or equipment form the largest single item. Snow is hard on equipment. The measures which have been taken to minimize these failures are proving effective. As to derailments, they are being studied by a special committee, with good results.

SERVICE IN COLD WEATHER

Cold weather is friendly weather for electric railways. Folks turn to your service naturally. Its safe, comfortable and prompt transportation is particularly welcome when the mercury is pounding at the bottom of the tube. You have more riders and they ride oftener. The audience to which you demonstrate your good service is much larger now.

But this enlarged opportunity carries with it an enlarged responsibility. Any failure in performance is demonstrated to your larger audience. Consequently it is desirable to minimize any shortcomings to the service at this critical time. —*O. B. Company folder.*

CHANGES IN THE RESERVE FUND

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	**$393,028.41***	Jan.	**$186,947.50†**
Aug.	**451,546.79***	Feb.	**92,018.37†**
Sept.	**236,543.80***	Mar.	**256,586.83†**
Oct.	**2,723.19†**	April	**181,694 29†**
Nov.	**29,302.22†**	May	**113,284.72†**
Dec.	**234.879.91†**	June	**92,917.54***

Profit and loss credit..... ..**$137,259.76**

Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*
Aug.	408,570.65*
Sept.	147,204.65
Oct.	79,421,56†
Nov.	34,226.52†
Dec.	280,536.75†

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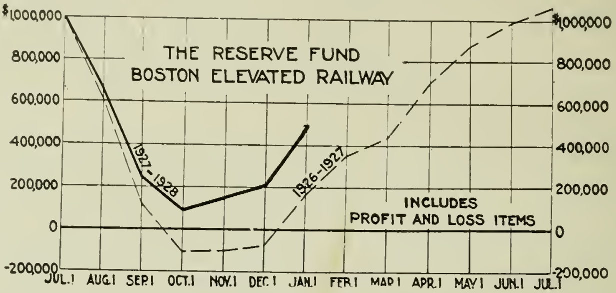
†Excess of revenue over cost of service.

*Excess of cost of service over revenue



DECEMBER OPERATION

GENERAL FINANCIAL DATA	1927	1926
Revenue exceeded cost of service............	$280,536.75	$234,879.91
Operating revenue per car-hour (A.E.R.A. std.)..	$6.41	$6.52
Operating revenue per car-mile operated............	63.49c	67.06c
Average fare per revenue passenger............	9.307c	9.263c
Ratio operating expense to operating revenue........	65.79%	68.94%
PASSENGERS CARRIED		
Revenue passengers............	33,644,529	35,474,895
Per cent 5c, 6c and 6¼c passengers............	17.81%	17.95%
Revenue passengers per car-mile operated............	6.616	7.026
OPERATING FACTS		
Trips operated............	642,400	647,280
Car-miles operated:		
Rapid-transit lines............	1,486,356	1,366,083
Surface, two-man............	1,782,749	1,923,811
Surface, one-man............	1,336,052	1,296,272
Newspaper and sprinkler cars............	....	386
Motor bus............	484,549	462,639
Total miles operated............	5,089,706	5,049,191
ACCIDENT DATA		
Accidents per 10,000 car-miles............	2.28*	3.04*
Accidents per 10,000 bus-miles............	2.85*	4.69*
Revenue passengers carried per accident............	16,980	13,670
Average number of witnesses per accident............	3.24	3.43
COMPLAINTS AND DEFECTS		
Complaints in regard to car service............	36	36
Employees complained of by car riders............	108	121
Car defects reported per 10,000 car-miles............	4.3	4.3
INFORMATION ABOUT POWER		
D.c. kw.-hr. output gross per month............	27,067,715	29,060,470
Maximum kw. load............	85,780	83,270
Tons of coal consumed for power............	22.560	24,567
Lbs. of coal for power per d.c. kw.-hr. at cars............	1.871	1.899
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service............	0.855c	0.856c
Per revenue car-mile............	4.66c	5.06c
Kw.-hr. per revenue car-mile............	5.45	5.911

*Does not include miscellaneous accidents or derailments.

Jan. 20, 1928 EDWARD DANA, *General Manager.*

Volume 7 FEBRUARY, 1928 Number 2

Boston Elevated Close-Ups

THE OXY-ACETYLENE OPERATOR

(See Page 22)

To All 'El' Employees

EARLY in November New England was visited by a disastrous flood, in which the State of Vermont was the principal sufferer.

In the transportation field our neighbor, the Boston & Maine, was hard hit. It suffered a damage to physical property of more than $2,500,000.

To repair the damage required 1,000,000 man-hours of labor; 950,000 feet (95 carloads) of lumber; 100,000 cross ties (250 carloads); 50,000 feet (50 carloads) of piles; 18,000 truck-hours; 15,000 days per diem charges for freight cars; 7,000 carloads of gravel, cinders, etc., 2,500 carloads of stone; 1800 train-days; 600 feet of concrete culvert pipe.

The expense of permanent restoration of bridges, buildings, water stations, signals, etc., as well as additional ballasting, surfacing and miscellaneous expenses, cannot be put into definite terms as yet.

The Boston & Maine came through the ordeal magnificently. Motor coaches were pressed into service to replace train service where tracks were washed out. Trucks were used to the limit.

There is a lesson here for ourselves and for all companies engaged in the public service. This lesson is preparedness.

The Boston Elevated has up-to-date equipment and an organization trained to meet emergencies. The supreme test is the manner in which we meet emergencies which cannot be anticipated.

They can be met only by the intelligent co-operation of each individual employee.

Edward Dana

PULVERIZED FUEL EQUIPMENT AT SOUTH BOSTON

New Boilers Are Equipped With Three Unit Mills Each. Two Boilers Require Total of 35,100 Pounds of Coal Per Hour at Maximum Load. Installation Represents Latest Practice in Combustion

IN the early days of the steam engine, coal was fed to the boilers by means of scoops by the firemen, that is the men who kept up the fires. We still have the firemen, but their duties are very different from what they were thirty years ago. With the best possible hand firing there is always a certain amount of irregularity in a fire. When fresh coal is put on, a blanketing occurs until the new coal is coked and ignited. The opening of the firing doors causes excess cold air to be admitted over the fire, tending to check the draft. Smoke is apt to be formed after all but the most skilful firing.

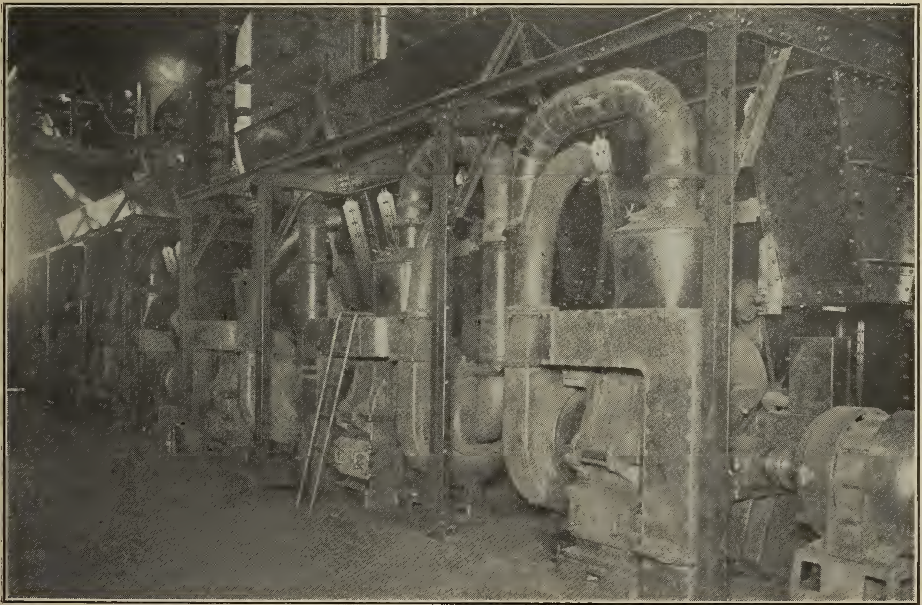
Hand firing wasn't so bad, however, when boilers were small; when a 100-horsepower boiler was a big one and 600-horsepower was about the limit. But the grate on a 600-horsepower boiler is a large surface to cover with coal by hand, so with larger boilers came a demand for mechanical firing. The automatic stoker was invented, furnishing a steady but easily adjusted supply of fuel. With it came automatic or nearly automatic means for conveying the coal from storage pile or bunker to the stoker hopper.

At first the stokers were of the overfeed type, the coal entering at the front and sliding downward over a rocking grate while air is forced through the bed from below under pressure. Later the underfeed type of stoker was introduced also, the fuel being forced upward through the bed by means of power-driven rams. Both types are in use today.

PULVERIZED FUEL INCREASINGLY POPULAR

Of recent years a popular form of firing has been the blowing of finely pulverized coal under the boiler by means of an air jet. In this form the coal burns almost like gas. In the earliest forms of pulverized-fuel installations the coal was pulverized, dried and stored in a small plant auxiliary to the boilers, sometimes in a separate building, but usually located in or adjoining the boiler room.

In competition with this type of installation there is now the unit type of pulverizing mill, in which one or more complete sets of pulverizer, fan, etc., are installed for each boiler. This type is illustrated in the Elevated power plant at South Boston, where three Combustion Engineering Company's unit mills are provided for each of two new boilers having a nominal rating 2075 horsepower each.



PULVERIZED-FUEL EQUIPMENT

View of six unit mills with fuel hoppers above. End of weighing lorry at upper left.

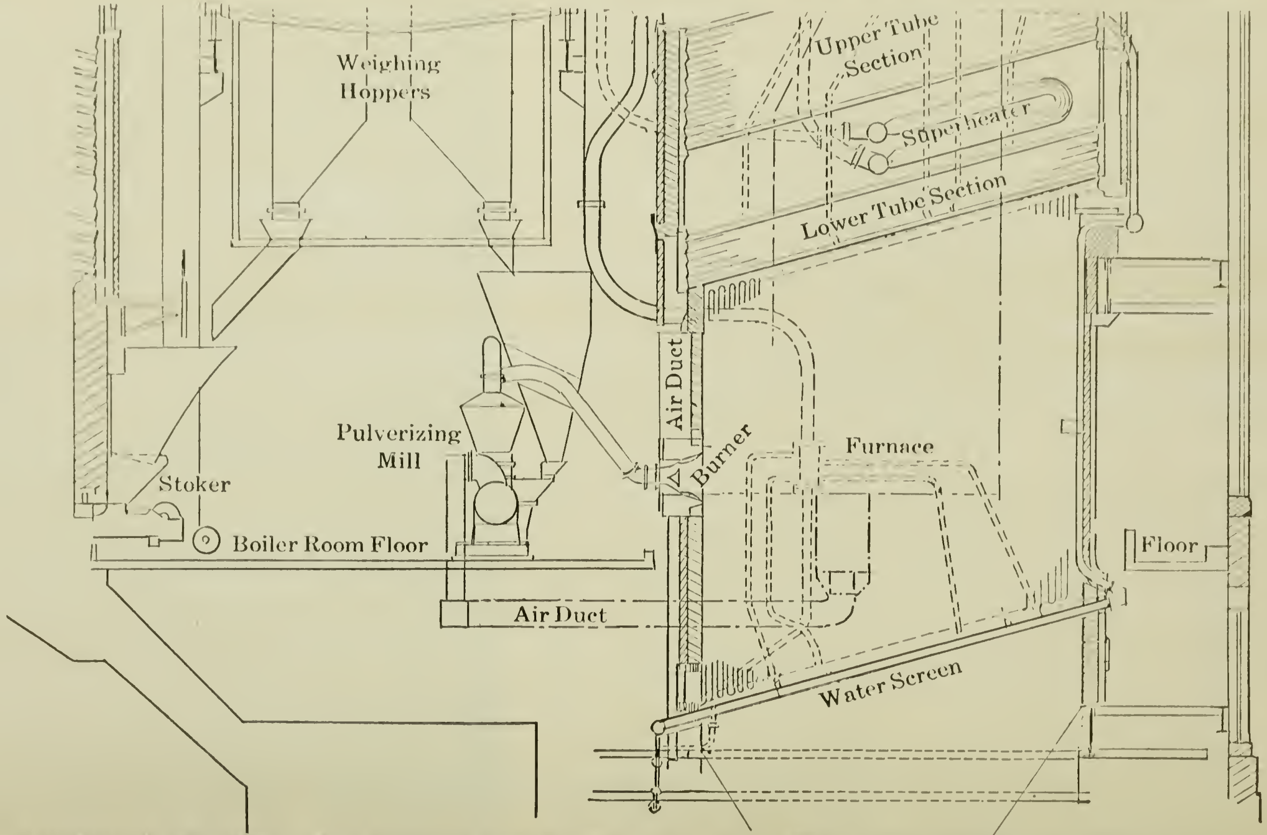


DIAGRAM OF EQUIPMENT FOR BURNING PULVERIZED COAL INSTALLED AT SOUTH BOSTON POWER STATION
(For more complete elevation of boiler house see issue of "Co-operation" for December, 1926, page 156.)

A description of the power-plant improvements, of which the pulverized fuel equipment is a part, was given in the December, 1926, issue of "Co-operation," page 155. The equipment has now been in operation for some time and it has been possible to photograph it in action. The accompanying halftones show the two boiler fronts, with the six mills in position, and close-up pictures furnish details of the equipment seen in the space between the mills and the boilers. With the aid of the diagrammatic drawing on page 20, enlarged from that reproduced on page 156 of the December, 1962, issue, it is possible to obtain a general idea of the details.

How the Equipment Operates

In this type of unit mill the air is drawn through the mill and out at the top by an exhauster fan, shown clearly in the pictures. This fan is on the same shaft as the pulverizer, the shaft being driven by an electric motor. The intake air enters through rectangular ducts seen in the picture on page 19 on the side towards the reader. Coal, received from an overhead weighing lorry, is fed mechanically from the side opposite the air inlet, at a rate which can be controlled by changing the speed of the driving mechanism. It is ground in the mill and drawn upward by the current of air flowing through the fan at high velocity.

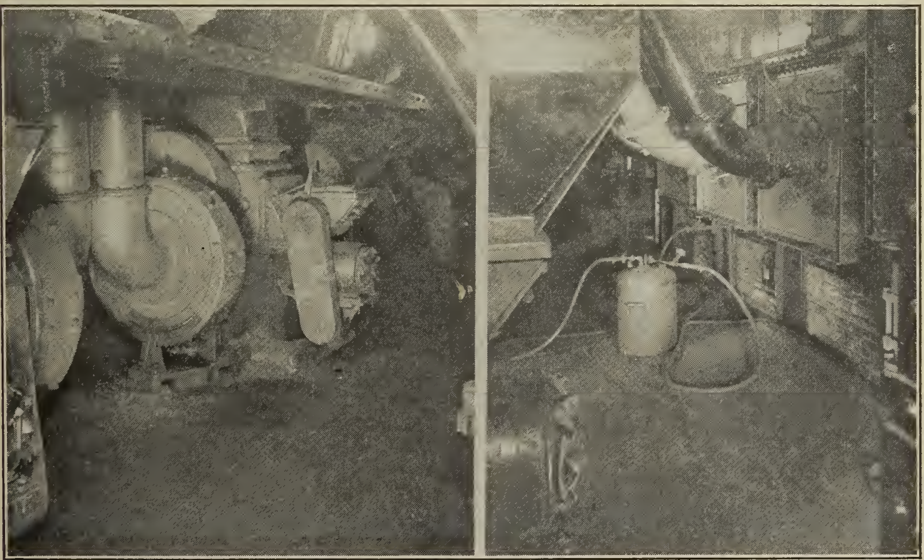
The pulverized coal and air mixture from the mills is driven into the combustion space in the lower part of the boiler through a rotary burner. Here it meets blasts of air supplied through the burner vanes, so that a turbulent mixture of coal and air is injected into the furnace. This mixture burns readily.

One method of igniting the mixture is by means of a kerosene pressure torch shown in one of the pictures at the bottom of this page.

The duty which can be performed by these mills is illustrated by statements in the preceding article. The two boilers can produce approximately 360,000 pounds of steam per hour under operating conditions, requiring the burning of 35,100 pounds of coal per hour. As there are six mills, each mill will, therefore, pulverize 5,850 pounds of coal per hour, or 97.6 pounds per minute, of 1.625 pounds per second.

A Prediction for the Future

In conclusion, it will be of interest to note that one of the leading power-plant designers in the country, in an Electrical World article, stated that "all new coal-burning stations will burn pulverized coal; present boiler-house construction will be revolutionized; the future boiler will be entirely water-cooled to obtain maximum efficiency." The new "El" boilers are water-cooled, that is the furnace or combustion chamber is lined with small water-carrying pipes placed close together, which minimize destruction of the boiler setting from the heat, and also absorb heat, thus assisting in the generation of steam.



PULVERIZED-FUEL EQUIPMENT

Left, fan intake from pulverizing mill and mechanism feeding fuel to mill. Right, pipes leading to burners and kerosene torch igniting apparatus.

ELEVATED CLOSE-UPS

The Oxy-Acetylene Operator

(See Illustration on Front Cover)

THE front page of this issue of "Co-operation" shows an oxy-acetylene operator cutting a steel beam, an operation requiring only a few minutes, which formerly took hours to accomplish by means of a hack saw or a pneumatic chipping hammer.

There is probably no process in use by the Railway which has proved to be a greater time-saver than the use of a flame for cutting steel, the flame being composed of two gases, oxygen and acetylene. The acetylene gas pre-heats the steel and the oxygen combines with certain elements in the steel fusing the metal. This fusion takes place within very narrow limits as the torch is moved along and produces a cut that is as clean as one made with a metal saw.

The outfit consists of a torch to which are attached two lines of hose, one leading to the oxygen tank, holding from 100 to 200 cubic feet of compressed gas, and the other to the acetylene tank holding either 100, 250, or 300 cubic feet of compressed gas. Each tank is provided with a regulator and gages so that the flow of each gas can be controlled by the operator. The gases flow through the hose connections to a mixing chamber within the torch and then to the tip where they are ignited.

The use of acetylene gas was discovered by accident in an attempt to produce metallic calcium by subjecting a mixture of coal, tar and lime to a high temperature in an electric furnace. When the furnace was opened it was found that it contained a dark colored mass, which on cooling was found to be solid and brittle. The material was clearly not metallic calcium and was broken up and thrown into a nearby stream to get rid of it. One of the chemists noticed bubbles of gas arising from the water and, applying a match, he found that it burned with a clear, bright flame. Further investigation was made and the process of manufacturing acetylene gas was the result.

The use of the oxy-acetylene torch for cutting metals, by the Railway, covers a period of approximately ten years.

In 1919, the maintenance department began to use the process, hiring an operator and the outfit when its use was required. The value of the process was quickly realized and in 1920 an outfit was purchased and an experienced operator hired. The use of the process has grown steadily and the Railway now has thirty-five outfits and many expert operators.

On Jan. 15, 1919, when the molasses tank on the Railway's property at Commercial Street collapsed, it was necessary to remove the debris, consisting largely of distorted masses of steel from the tank, as quickly and safely as possible. The Railway, at that time, was not equipped with a sufficient number of these outfits to handle the situation. In fact, it was necessary to secure experienced operators and the outfits from all sources. The work of removing the twisted, dangerous plates of jagged steel was quickly accomplished, which resulted in Commercial Street being opened to traffic at a much earlier date than could otherwise have been the case.

Prior to the use of this process by the Railway, the cutting of steel was usually done by hand chisels, hack saws, pneumatic chipping hammers, shears, etc.

In the structural steel shop, where it is necessary to cut plates, angles, channels, and other shapes in connection with the fabricating of bridge and building material, the process is invaluable, both on account of the saving of time and the possibility of using plate steel without waste.

Many odd shapes are required in fabricating structural steel and with this process it is possible to lay out the patterns on a steel plate in much the same way as a dressmaker lays out patterns on cloth. With an expert operator, the steel, regardless of its thickness, can readily be cut exactly to line.

Both oxygen and acetylene can be readily purchased from several manufacturers in the vicinity of Boston, and contracts are made annually for these gases. It is not necessary for the Railway to keep a large stock of compressed gases on hand, as arrangements have been made for quick delivery in practically any quantities required and at any time during the day or night. Arrangements have been made for quickly transporting the necessary tanks from headquarters to the place where they will be used.

During the season of rebuilding surface tracks, from ten to twelve of these outfits are used at frequent intervals to cut the old rails into suitable lengths for removal and for loading on freight cars for sale as scrap. Prior to the use of this process for this purpose, it was necessary to cut the joint bolts with hammers and chisels, remove the joints, pull the spikes, load the 60-foot rails on cars, take them to George Street Yard where they were piled up and later sold. It was necessary to cut them into suitable lengths so that they could be loaded

(Please turn to Page 25)

BOSTON ELEVATED RAILWAY, 1920 AND 1927

WAGE RATES, PASSENGERS CARRIED AND MILES OPERATED INCREASE—AVERAGE FARE, PAYROLL AND OPERATING EXPENSES DECREASE—ECONOMY AND EFFICIENCY CONTRIBUTE TO RESULTS

IT is comparatively easy to talk in general terms and without adhering closely to facts.

One way in which the operation of the Boston Elevated Railway during the last eight years may be studied is to set up in parallel columns a few vital operating statistics for the two years 1920 and 1927 and then analyze what these figures disclose.

Looking at the statement which has been prepared along these lines we find that 31 million more people used the "El" in 1927 than in 1920, and the average fare per revenue passenger decreased from 9.868 to 9.266 cents.

We find that 5½ million more miles and 1½ million more round trips were operated in 1927, and as a result the number of revenue passengers carried per mile decreased from 6.548 to 6.457.

Without the economies which have been effected, the wage increases awarded during the 8-year period would have placed a burden on the car riders of 4 million dollars. Fixed charges (taxes, rent of leased roads, dividends, subway and tunnel rents, interest on bonds and notes) have increased by 1¼ million dollars in this period.

Notwithstanding the wage and fixed charge burdens, the actual payroll was $459,107 less in 1927 than in 1920 and operating expenses as a whole were $636,789 less than in 1920.

If operating expenses in 1927 had taken the same percentage of passenger revenue as in 1920 there would have been a deficit in 1927 of $1,293,668.54 instead of a surplus of $222,000.

It would seem, therefore, that a system that is carrying more people, running more mileage and more trips, having fewer disastrous delays and reducing the average fare, while at the same time absorbing 1¼ million dollars more in fixed charges and wage increases amounting to 4 million dollars

AN EIGHT-YEAR COMPARISON

	1920	1927	Increase	Decrease
Revenue passengers, 5c fare	8,952,577	8,534,666	....	417,911
Revenue passengers, 6c and 6¼c fare	....	58,890,542	58,890,542	....
Revenue passengers, 10c fare	326,496,184	299,340,854	....	27,155,330
Special car and bus passengers	77,800	172,846	95,046	....
Total	335,526,561	366,938,908	31,412,347	....
Average fare per rev. pas.	9.868c	9.266c	....	0.602c
Wages—Amal. and Craft Employees	$14,040,747	*$18,045,550	*$4,004,803	....
Actual total wage cost	$17,216,445	$16,757,338	....	$459,107
Average employees on payroll	9,628	8,607	....	1,021
Gross revenue	$34,031,636	$35,193,410	$1,161,774	....
Fixed charges (taxes, rent of leased roads, dividends, subway and tunnel rents, interest on bonds and notes) and miscellaneous items	$8,609,681	$9,838,261	$1,228,580	....
Operating expenses	$25,769,122	$25,132,333	....	$636,789
Ratio of operating expenses to gross revenue	75.721%	71.412%	....	4.309%
Revenue-mileage	51,237,527	56,827,962	5,590,435	....
Round trips operated	5,764,347	7,295,371	1,531,024	....
Car defects per 10,000 car-miles	13.4	3.8	....	9.6
Revenue passengers per mile	6.548	6.457	....	0.091
20-minute delays in service	885	500	....	385

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*Based on hours and rates of 1920.

If operating expenses in 1927 had taken the same percentage of gross revenue as in 1920, they would have been greater by $1,516,484, and there would have been a deficit for the year of $1,293,668.

(as well as providing for an 8-hour minimum day and a 6-day week) should be considered as functioning reasonably efficiently.

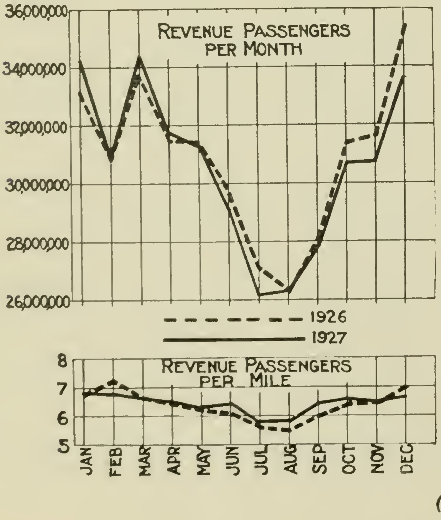
It is easy to criticise, it is easy to pick out isolated defects in any undertaking, but delays of 20 minutes' duration have been reduced from 885 to 500 per year; defective cars per 10,000 car-miles have been reduced from 13.4 to 3.8, and the patrons have at their service 18¾ million dollars worth of new cars in which to ride.

None can commend any discourteous act of an employee. There is no joy for either the car rider or the management when cars become disabled and cause delay. Irregular spacing of cars due to traffic congestion causes consequent overloading and the result is to be regretted wherever and whenever it occurs. Constant effort should be made to eliminate such deficiencies in the service.

When we stand off, however, and visualize the operating problems of the Elevated and the results obtained, we must admit that the car rider has fared well, the employees have fared well, and the owners of the property have received what they bargained for. Success rather than failure is the verdict of the last eight years' struggle, which may be characterized by the single word—COOPERATION.

REVENUE-PASSENGER DATA 1926-1927

After the close of a year, it is interesting to examine the records of passengers carried month by month. The most convenient way in which to do it is to plot the data in chart form. Thus at the bottom of this column there are shown the number of passengers carried each month for the past two years and the corresponding record of passengers per car-mile obtained by dividing the total passengers by the monthly mileage in each case. Anyone can check these graphs from the data given on the last page of "Co-operation" each month.



Comparing the monthly passenger records it will be noted that business was a little better at the beginning of 1927 than it was the preceding year. Weather conditions favored this, as the winter weather was unusually bad in the early part of 1926. From May on the reverse was true. August was comparatively good in 1927, because the Railway conducted a business-getting advertising campaign. "El" traffic held up in August, although comparable railways in New England fell off about 4 per cent in traffic in August. The pleasant weather of last fall and the present winter has favored the automobile. Further, the electric railway is sensitive to business conditions, which were not favorable in 1927. On the whole, however, the falling off in total traffic on the "El" last year was small compared with what it was in many parts of the country. The drop was from 371,218,401 to 366,938,908, which was 4,279,493 or 1.152 per cent.

The lower of the two charts will bear close study. It will be noted that the solid line (1927) is more nearly uniform than the broken line. If the mileage were changed in exact proportion to passengers carried, then the line would be straight and horizontal. It was more nearly so last year than the year before, because the summer mileage was reduced more than before.

GENERAL MEETING ON MARCH 14

The general meeting of Elevated employees, combined with the monthly meeting of the Supervisors' Association, which was scheduled for Feb. 15, was postponed owing to the serious illness of Lucius S. Storrs, managing director American Electric Railway Association, who was to have been the principal speaker. The postponed meeting will be held on Wednesday, March 14, at 7:30 P.M., at the Instruction School, Sullivan Square. The speaker will be W. H. Sawyer, formerly president of the American Electric Railway Association, and of the East St. Louis & Suburban Railway. Mr. Sawyer is now president of the firm of Stevens & Wood, Inc., New York City. He is a forceful speaker and, like Vice-President Dawes, is lost without his pipe. Mr. Sawyer recently was engaged on an important consulting engineering job in Australia. He is one of the outstanding figures in the electric railway industry and a good friend of the Boston Elevated Railway.

CLOSE-UP

(Concluded from Page 22)

into cars 40 feet or less in length. It was particularly difficult and costly, as well as dangerous, to cut these rails by the means then existing. The method now pursued accomplishes all of these purposes and reduces the cost very considerably, as well as lessening the time.

When the change in the East Boston tunnel was made from trolley to third rail operation, it would have been impossible to accomplish this change in the time allowed without the aid of this process. Fourteen oxy-acetylene outfits were used during the period to remove the old guard rail, cut it into suitable lengths, cut various track fittings, such as bolts, spikes, etc., and do various other kinds of work.

Each wrecking truck or car is equipped with one of these outfits, which are carefully inspected at regular intervals to insure their being in perfect working order when needed.

Anyone who has assisted in replacing a derailed car or a car that has been badly damaged in a collision, particularly since steel cars have come into general use, will realize the time that is sometimes required to cut a bolt or a king pin. Such difficult jobs can be readily handled by the use of the oxy-acetylene torch, resulting in the line being cleared for regular operation much more promptly.

This apparatus lends itself not only to the cutting of metals, but to welding as well. For certain kinds of welding, the oxy-acetylene torch gives better results than the electric arc, particularly with cast iron or cast steel. It will not be possible, in the space allowed, to go into the relative merits of oxy-acetylene welding as compared with electric welding. It will be sufficient to say, however, that for the purpose of welding track joints, building up worn special trackwork, rails, wheels and various car parts, the Railway has found the electric weld to be superior on account of the simplicity of the operation as well as the results obtained.

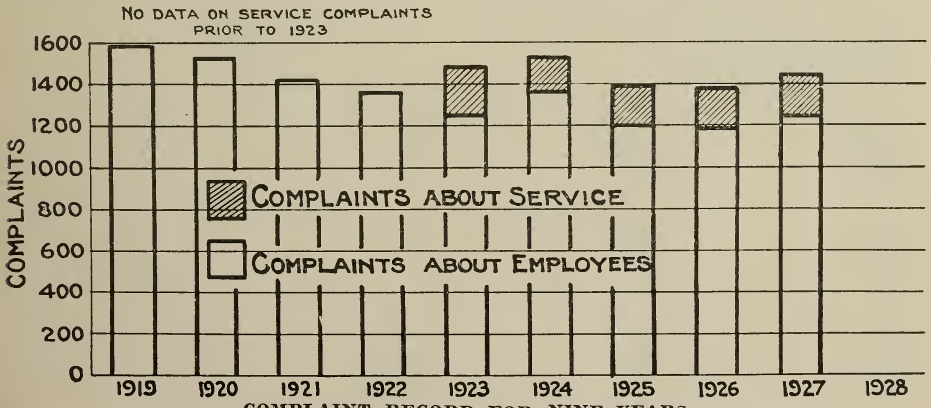
The maintenance department has twenty-three oxy-acetylene outfits assigned to it, and the department of rolling stock and shops makes use of twelve outfits at the various shops and in the wrecking equipment.

COMPLAINTS SLIGHTLY INCREASED

Below is a chart showing the complaint situation for several years. There were slight increases last year both in complaints regarding service and regarding employees. The monthly record appears on the last page of each issue of "Co-operation." From the monthly record it is seen that complaints are most numerous in winter, particularly service complaints. Service complaints are almost negligibly few in summer. This indicates that many of the complaints are due to the more difficult operating conditions which are necessarily associated with the winter season.

All complaints are carefully investigated and when necessary the complainant is visited by an official of the Railway. In many cases complaints are due to misunderstandings. When this is not the case, it is sometimes possible to remedy the situations complained of. When this is not possible the complainant is shown why it is not so.

Whatever the cause of the slight increases last year, the fact that such did occur should provide a stimulus to make a better record for 1928. To be sure, there will be some complaints even under the best of conditions. A courteous bearing, however, with explanation where this is acceptable to the complaining patron, will go far toward bettering the complaint record. Watch the comparative records month by month.



COMPLAINT RECORD FOR NINE YEARS

TROLLEY BREAKS

Breaks in the overhead trolley do not just happen, there is always a cause. Some of these, such as wire pulled or burned down by trucks, steam shovels, derricks and other equipment not owned by the Railway, grounding by wires of other companies, falling trees, falling poles of other companies, cannot be removed by the Railway.

These and other causes can be reduced to a considerable extent. How? By **co-operation** and the use of improved material and methods of construction and maintenance.

Vibrations and flaws in material can be reduced by co-operation with the manufacturers of trolley wire and other material; by improved methods of construction, and by greater alertness of line crews.

Small wire requires greater alertness of line crews. Troubles from this source should be completely eliminated.

Reducing the number of wires burned down by cars and pulled down by cars requires co-operation of the power department, the department of rolling stock and shops and the transportation department; and better maintenance of the overhead construction and of the trolley equipment on the cars and the careful operation of cars. The pulling or burning down by trucks or other foreign equipment requires co-operation with the owners of this equipment.

Old burns can be largely eliminated by co-operation of the power department, the maintenance department, the department of rolling-stock and shops, the transportation department and the other power companies; also, by increased alertness of the line crews.

The key to the reduction of trolley breaks is **co-operation.**

JANUARY DELAYS SHOW IMPROVEMENT

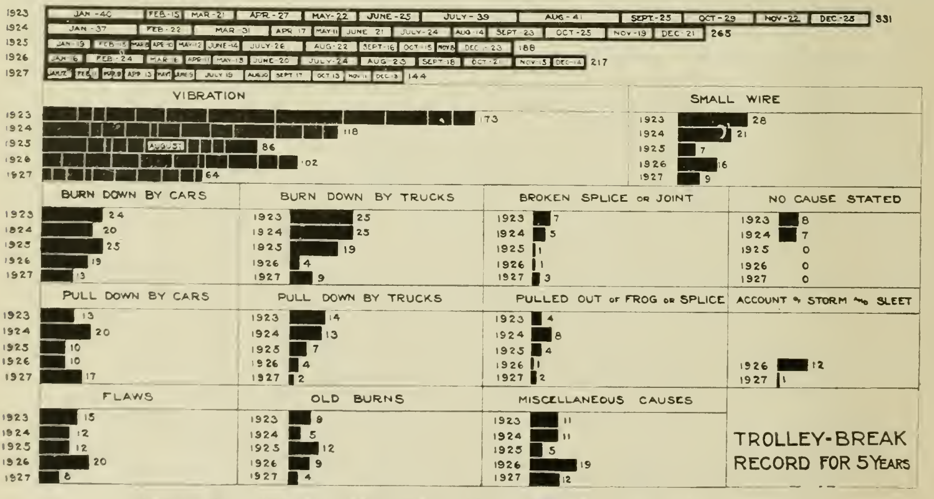
Supplementing the article in the January issue of "Co-operation," page 15, the accompanying table is given to show the delay situation for a typical month, January, 1926, 1927 and 1928. It is evident that in those causes of delay for which the Railway is responsible there is a very marked reduction. The total of derailments, collisions, wire breaks, including power failure and defective cars or equipment for the three years were: 1926, 39; 1927, 40, and 1928, 23.

This shows what a determined effort in a given direction will do.

SUMMARY BY CAUSES OF DELAYS OF 20 MINUTES OR LONGER

Month of January

	1928	1927	1926
Derailments	3	10	15
Vehicles broken down or stalled on tracks—obstructions	15	12	20
Collisions	6	6	5
Wire breaks or power failure	5	6	5
Fires	13	13	20
Defective cars or equipment	9	18	14
Parades or traffic—general delay	1	0	0
Drawbridges	0	3	0
Water breaks, or water, ice or sand on tracks	0	0	0
Fatal accidents	0	1	0
Loss of schedule trips	0	0	0
Total	52	69	79



TROLLEY BREAKS BETTER THAN HALVED IN FIVE YEARS

KEEPING CARS ON THE ROAD*

With Particular Reference to the Effect of Car Shifts on Company Relations with the Public and to the Car Operator's Responsibilities

By **HENRY S. DAY**

Superintendent of Equipment, United Electric Railways, Providence, R. I.

OF recent years there have been great changes in the conditions in the transportation field due largely to the extended use of the automobile. Electric-railway traffic has been steadily falling off but a change the other way begins to be noticeable.

The corrective factor is the congestion in the business centers of cities, which is to an increasing extent forcing automobile users to park their cars outside of the business sections, using the railway and bus lines to bring them into the centers.

But while traffic is coming back to the electric railways, the railways must realize that they have now to handle a rider with a different point of view. When the rider had to take the street car whether he wished to or not, the situation was different. Now he expects and demands better service than ever before, the standards of service being set for him by the automobile.

He wants quiet cars, operated on time and manned by courteous employees. He expects practically automobile service from street cars. The transportation department comes in at this point, in giving him, as far as possible, what he wants.

The transportation man has a great opportunity, because he is in contact with the public. This has an important bearing on the subject under discussion, namely, the effects of car shifts or changes, or, as they are called in some parts of the country, "pull-ins."

If a road has a large number of car shifts, there are great opportunities for dissatisfaction on the part of patrons. In one city in a recent month there were four hundred such car changes. Now, if there are ten passengers per car on the average and if all of these car changes may be assumed to involve a shift of passengers, then there were four thousand passengers who might be disgruntled.

While many of the car changes are due to mechanical defects, some are within the control of the transportation department. If possible, a car should be kept going to the end of the run so that passengers need not be transferred. The transportation department should be willing to take its share of the responsibility for keeping the cars going.

Not only is the convenience of the passengers to be considered in this matter but cost is an important element. If through careless car handling a motor must be repaired, the cost may be from $50 to $200 or $300. Multiplying this cost by the number of cars on a railway gives a surprising total.

Some statistics regarding car changes for a recent month, are as follows:

	Mech. Dept.		Trans. Dept.	
	Changes	Miles Per Change	Changes	Miles Per Change
Covington	6	55,000	18	18,000
Pittsburgh	108	30,000	175	18,000
Mobile	7	24,000	8	21,000
Dallas	39	19,000	12	64,000
Louisville	141	8,000	59	19,000

Car operators must realize that operation today is radically different from what it was twenty years ago. Then cars weighing 50,000 pounds with motors weighing 2,800 pounds were common. As the economics of car operation was studied it was learned that such weights are not necessary for good service. Moreover, it costs money to carry around unnecessary weight. Before the war it was estimated that it cost 5 cents per pound per annum to haul car weight. Since the war it is likely that the cost is 10 cents per pound. This indicates that a car weighing 20,000 pounds more than necessary costs $1,000 a year more than necessary to haul around.

Nowadays a 30,000-pound car does the work of a former 50,000-pound car, and is driven by 1,400-pound motors.

But, while the lighter motors are ample for the duty they must be handled in a different way. They do not have the same capacity for storing heat, and hence cannot absorb the effects of high accelerating current.

When an accelerating time is set for 7 to 8 seconds it is damaging to the motors if the time is cut down to 3 or 4 seconds. The motors may not show the damage immediately, but in the end they will require expensive repairs. Unnecessarily quick acceleration is a serious fault.

Putting on the current too rapidly is like pumping water too fast into a piece of pipe with weak walls. The walls are apt to be damaged.

Another fault in operation is reversing, which is just as bad as fast notching. The reverse should never be used in place of the brakes. It must be reserved for extreme cases of emergency.

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*Abstract of address before the third Transportation Department Group Conference, J. A. Griffin, chairman, Sullivan Square, Jan. 6, 1928.

The effect is not only to overheat the windings but the armature shaft may be bent, etc.

From all of the above it is obvious that a car operator can materially affect the cost of operating a car.

In its efforts to reduce the number of car changes the United Electric Railways, Providence, R. I., has divided its pull-ins into three classes, it being understood that a pull-in is anything that takes a car off its regular run. The classes are:

a. Pull-ins due to mechanical defects.

b. Pull-ins chargeable to the transportation department.

c. Pull-ins which are chargeable to neither of these departments.

By study of the details of these occurrences, each department examining the causes of the troubles for which it is responsible, it is expected that the record in Providence will be improved.

ST. CLAIR ADDRESSES SUPERVISOR'S ASSOCIATION

About 350 men turned out to hear Labert St. Clair, director of publicity of the American Electric Railway Association, at the fifth meeting of the Boston Elevated Railway Supervisor's Association. He was announced to speak on the topic, "A 'Hoosier's' Observations in the Electric Railway Industry," and he told of some of the outstanding characteristics of the electric railway business. Modernization, he said, is the order of the day. Everywhere the railways are brightening up their cars, making them better and more attractive and in every way endeavoring to sell rides. Last year there was a railway or railway-bus ride for every postage stamp sold by the government, 16,000,000,000 in all.

There is, said Mr. St. Clair, a big future for the electric railway in spite of the fact that there has been a temporary slump all over the country.

Continuing he said that along with modernization go advertising and other means of merchandising service. Last year the electric railways spent $6,000,000 in advertising, whereas a few years ago they spent practically nothing. Mr. St. Clair illustrated his remarks with humorous illustrations. He was followed by a minstrel entertainment of high class.

The period for enrollment as charter members in the Association expired with this meeting. It is understood that about 500 members will be in the charter-membership class.

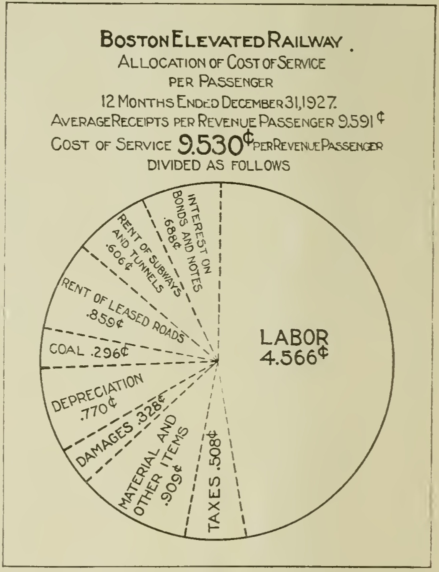
The next meeting will be held on March 14 and as a general educational meeting is arranged for that date the Association will combine its meeting with the other, under Mr. Dana's chairmanship.

The new platform in the schoolroom was used for entertainment for the first time at this meeting. The Association voted thanks to the management for this improvement.

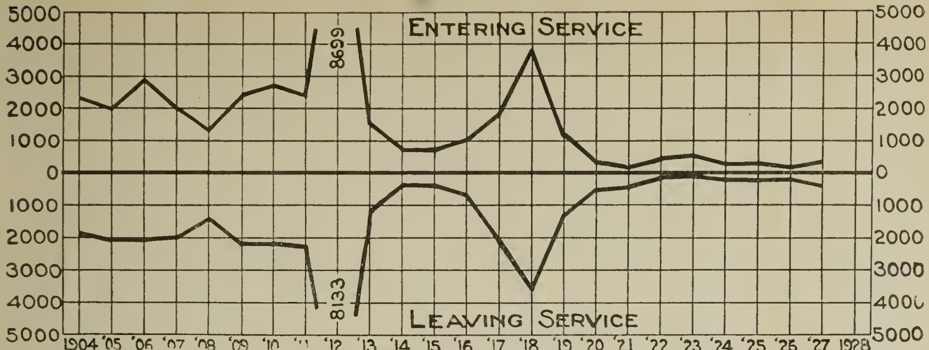
FACTS ABOUT FARES

The average rate of cash fare in 258 cities in the United States of 25,000 population or over on February 1, 1928, was 8.107 cents.

The average fare per revenue passenger on the Boston Elevated for the year 1927 was 9.266 cents. In view of the fact that rental of subways and tunnels, which in Boston all falls upon the car rider, amounts to 0.6 cent per revenue passenger, in addition to increasing the average length of haul over other cities, the allegation that the fare in Boston is exceptionally high is not confirmed by the facts.



The diagram above, which is reproduced from the annual report of the Public Trustees of the Boston Elevated Railway, for the year ended Dec. 31, 1927, shows how the cost of service was divided in 1927. The receipts per revenue passenger, which includes all receipts divided by the number of revenue passengers and not the fare alone, averaged 0.061 cent more than the cost of service. Stated in approximate percentages, the items appear thus: labor 47.9 per cent; material and other items 9.5 per cent; rent of leased roads 9.1 per cent; depreciation 8.1 per cent; interest on bonds and notes 7.2 per cent; rent of subways and tunnels 6.4 per cent; taxes 5.3 per cent; damages 3.4 per cent; coal 3.1 per cent.



ANNUAL TOTALS OF MEN ENTERING AND LEAVING BLUE-UNIFORM SERVICE

A 24-YEAR EMPLOYMENT RECORD

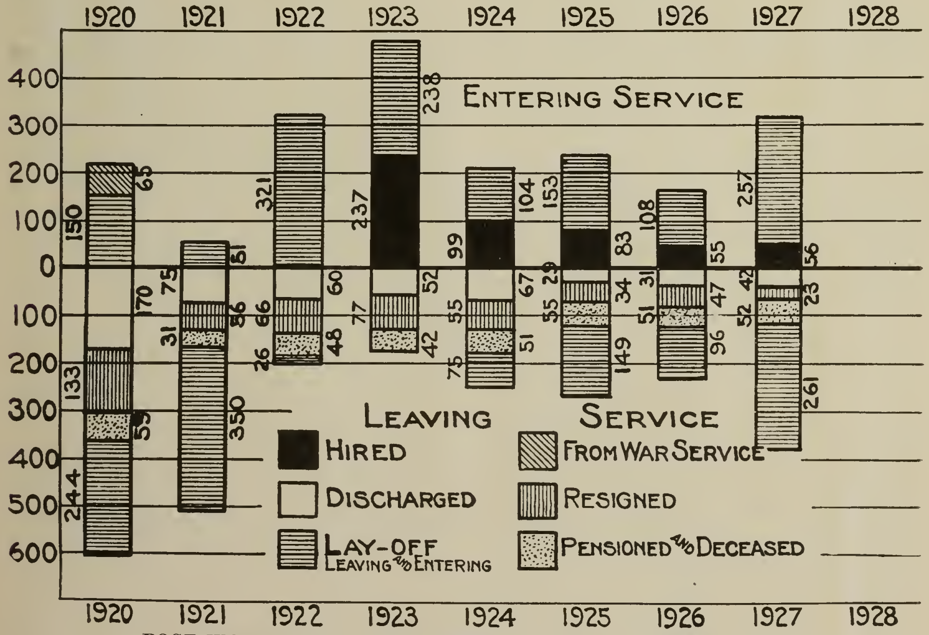
The diagrams on this page give at a glance the story of the changes in personnel in the blue-uniform ranks. Barring the seasonal change in working force, 1927 illustrated the remarkable stability of employment in this large and important section of the railway organization. The seasonal change last year was greater than that for a few years preceding due to the reduction in car-mileage made under the summer schedule.

Only fifty-six new men were hired last year, practically the same as the preceding year and less than a quarter of the number hired in 1923, and only forty-two were dismissed, a quarter of the number dismissed in 1920. Resignations last year were only twenty-three, the lowest number in many years. The men pensioned or deceased in service number roughly the same each year, not far from fifty.

The whole situation is remarkably different from that of twenty years ago when the turnover was about 2,000 annually, or nearly 40 per cent of the force.

Some people never do anything on time but quit work.—*Winchester Record.*

Don't kid the safety idea—you might be the goat.—*Commonwealther.*



POST-WAR DATA OF CHANGES IN BLUE-UNIFORM FORCE

CRIMINAL LAW*

After Defining His Subject the Speaker Explained the Procedure in Criminal Cases, Including the Making of a Plea by the Defendant, Safeguards Provided by Law for the Defendant, Prerogatives of the Jury, Function of the Trial Judge and Relative Topics

By JOHN T. HUGHES, Esq.
Attorney at Law, Boston, Mass.

AT the outset it may be well to distinguish between criminal law and the law of torts. The word "tort" means a "wrong," and the law of torts deals with such inherent rights as men have, both with respect to themselves, their property and their reputation. Criminal law deals with violations of law that regulates the conduct of people in matters in which the primary duty is deemed to be not to individuals, but to the community.

For the present purpose criminal law may be divided roughly into three classes: Law relating to treason against the government, law relating to serious crimes or felonies, and law relating to misdemeanors or less serious offenses.

Criminal proceedings may be begun in either of two ways: (1) A complainant may make a sworn statement about an alleged crime in a local court and the judge may issue a warrant for the arrest of a person or a summons to him to appear and answer the charge. (2) Proceedings may be begun by indictment of a Grand Jury without any action of a lower court. In the case of some crimes of serious nature all that the lower court can do is to hold the defendant for the Grand Jury. Such would be true with a charge of murder. In such a case the lower court does not determine guilt, but merely "probable cause," that is that the evidence is sufficient to warrant reference to the Grand Jury. If the evidence warrants, the Grand Jury may, by majority vote, bring in an indictment or true bill. This does not mean that the defendant is guilty, but that the evidence warrants reference to a traverse jury of twelve mén, whose verdict must be unanimous. A disagreement of the traverse jury requires another trial or some other disposition of the case.

If a judge hears a complaint and decides not to issue either a warrant or a summons there is nothing further to be done except to appeal to another judge, which is seldom done, or to have the matter investigated by the Grand Jury.

In some cases arrest may be made without a warrant or previous complaint or indictment. An officer may, in certain cases of misdemeanor committed in his presence, arrest without a warrant. Suspicion that a felony has been committed justifies a police officer. In some cases a private citizen may make an arrest.

Once brought before a court of this state a defendant has rights provided by the Constitution of the United States and the Constitution of the State of Massachusetts, such as the right to have a charge fully described to him, the right to produce all proofs favorable to him, the right to meet witnesses face to face, and the right to be fully heard in his own defense or by counsel of his selection. Ours is a "government of laws and not of men," and no man can be charged with the commission of a crime unless he has done something which the law says is a crime. No whim of a public official, however high, can change this condition.

Moreover, a defendant is not required to testify in his own behalf and there is to be no prejudice against him if he elects not to do so. Under present law he may testify, but his failure to testify is not the omission of a duty.

Until evidence sufficient to establish guilt as a fact is produced the defendant is presumed to be innocent. This, however, is a presumption and is not evidence of innocence.

When a man is brought before the bar of a court he is "arraigned." He hears the complaint or indictment read and is asked to plead "Guilty" or "Not Guilty." Before doing so he has a right to raise certain questions of law in regard to the complaint or the indictment. He or his counsel may make motions to dismiss the indictment for reasons, but this must be done before the plea is made.

When the plea is "Guilty," the only question is the penalty. When it is "Not Guilty," the man is entitled to be tried by a jury of twelve. He has certain rights in regard to challenging the jury to ensure his having a jury that he considers a fair one.

When the jury is drawn the burden is on the Commonwealth to prove guilt beyond a reasonable doubt.

In Massachusetts, the laws relating to crime are divided into certain classes. For instance, there are crimes against the government known as treason; then there are crimes against the person, which may include anything from murder to the simplest form of assault and battery. Murder, in turn, is sub-divided into murder in first degree, in second degree and manslaughter. Next, there are crimes against property, such as theft, intentionally setting fire to property, maliciously injuring personal property, etc.

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*Abstract of the fourth lecture in the course in Everyday Law, F. W. Casey and E. M. Brooks, committee in charge, delivered at Franklin Union and Sullivan Square, Monday, Dec. 19, 1927.

There are also crimes against justice, such as endeavoring to interfere with its administration.

Again, there are crimes against the public currency, that is counterfeiting money. Such cases are usually handled by the Federal Court.

Again, there are crimes against the public peace, in the extreme case amounting to riot, involving the security of people and the safety of property. There are also crimes against public policy as, in business, involving restraint of trade. And there are crimes against morality. A man may not desert, abandon and fail to support his wife and children without transgressing the criminal law.

In some offenses there must be the element of actual intent to constitute a crime. In other cases, as in criminal negligence, the intent is implied by law. A truck driver who kills a pedestrian does not intend to kill a particular person, but by driving recklessly he takes the responsibility for the consequences. The test is: "Did he show a wilful, wanton and reckless disregard of human life?"

As stated, actual intent may have to be found, as for example when a person takes a coat belonging to someone else. A man taking a coat by mistake is not a criminal.

There are cases also where actual intent has nothing to do with the situation. If a man sells adulterated milk he is liable to punishment regardless of his intent or even of the care which he exercised in his business. In other words there are wrongs that are wrong in themselves. There are also things which are wrong merely because the law says they are wrong. Without reference to whether it is right or wrong in itself to drive an automobile on a certain highway above a certain speed where the law says it shall not be driven at more than this speed, it is an offense against the law, because that is what the law calls a wrong by prohibition.

In the trial of a case after all the evidence is in, the judge "charges" the jury, that is explains the law in relation to the case in hand. He cannot charge on the facts. Then the jury reviews the case and brings in a verdict based on its own opinion.

In arguing a case the defendant's counsel argues first to the jury, in doing which he has a wide latitude. When curbed improperly by the judge he may file exceptions for review by the supreme court.

If a defendant is found not guilty he is discharged and that is the end of it. If he is found guilty the penalty is then fixed. There are two schools of thought in the matter of sentence, one preferring severe sentences as a deterrent to crime, the other favoring such sentences as tend to encourage reform of the criminal. Almost any sentence that is passed is liable to criticism from one school or the other.

Regardless of the legal aspects of this question any community has a duty with respect to itself in relation to crime and that is to consider the atmosphere in which children are being reared. Sam Johnson said, "Politeness is benevolence in small things." If good manners are taught from that point of view and children are trained to do right as a matter of right and self-respect and not in fear of punishment, then the community is doing something that makes for the development of character in the individual. If that general motive is inbred in children we shall finally have a generation of adults whose general conduct will be based on character, self-respect and the recognition of the rights of others. After all, the amount of crime in a community is always related to the general tone of that community, the general conditions under which people live and the ideals which they hold.

MR. HUGHES' ANSWERS TO QUESTIONS

Following the address Mr. Hughes answered several questions as follows:

Q. What is meant by a plea of "nolo"?

A. The plea of "nolo contendere" means that the accused prefers not to plead either guilty or not guilty. He may be let off without a fine under such a plea and be required to pay only costs. The advantage of this is that the record of a case in which the plea has been "nolo contendere" cannot be brought into court later to confront a man and impeach his credibility as a witness.

Q. In what cases can a judge order a verdict from a jury?

A. A judge orders a verdict only when the law does not permit any other verdict. Thus if a truck driver injured a man and there was clearly no negligence on his part the judge would order a verdict accordingly. A judge orders a verdict because he believes that the law would not allow the jury under any circumstances, even if they believed everything that was claimed by the plaintiff, to bring in a verdict for the plaintiff.

CHANGES IN THE RESERVE FUND

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	$186,947.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	286,543.80*	Mar.	256,586.83†
Oct.	2,723.19†	April	181,694 29†
Nov.	29,302.22†	May	113,284.72†
Dec.	234,879.91†	June	92,917.54*
Profit and loss credit......			..$137,259.76

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†Excess of revenue over cost of service.

Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*	Jan.	$191,381.71†
Aug.	408,570.65*		
Sept.	147,204.65		
Oct.	79,421.56†		
Nov.	34,226.52†		
Dec.	280,536.75†		

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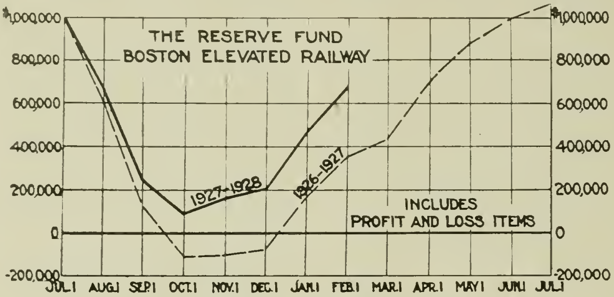
*Excess of cost of service over revenue



JANUARY OPERATION

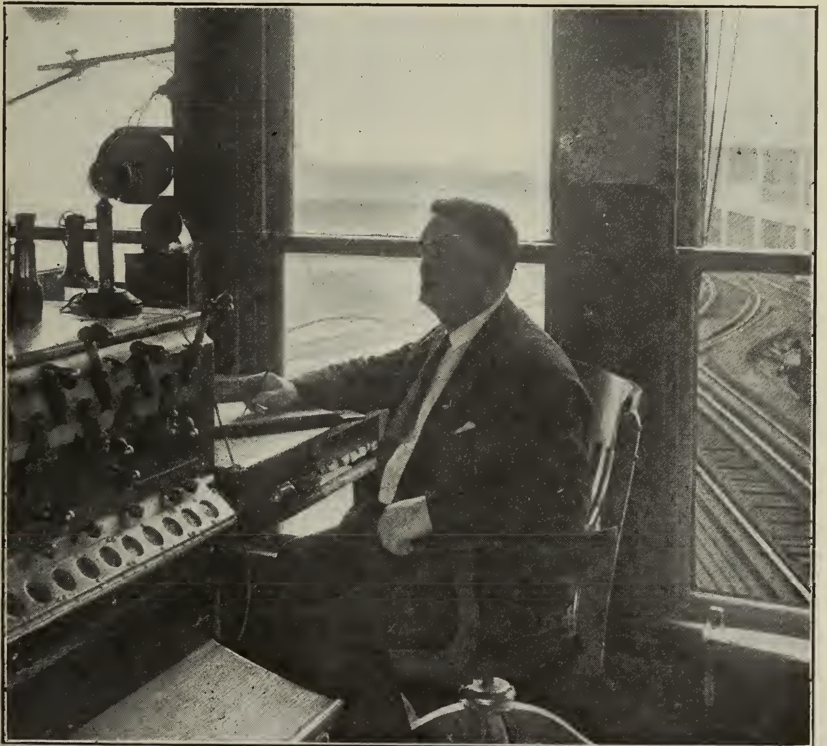
GENERAL FINANCIAL DATA	1928	1927
Revenue exceeded cost of service	$191,381.71	$186,947.50
Operating revenue per car-hour (A.E.R.A. std.)	$6.47	$6.27
Operating revenue per car-mile operated	63.40c	64.88c
Average fare per revenue passenger	9.262c	9.212c
Ratio operating expense to operating revenue	67.67%	68.78%
PASSENGERS CARRIED		
Revenue passengers	33,164,520	34,160,787
Per cent 5c, 6c and 6¼c passengers	18.89%	19.09%
Revenue passengers per car-mile operated	6.615	6.826
OPERATING FACTS		
Trips operated	633,881	642,696
Car-miles operated:		
Rapid-transit lines	1,446,106	1,319,683
Surface, two-man	1,737,901	1,907,148
Surface, one-man	1,341,618	1,311,297
Express, newspaper and sprinkler cars	....	387
Motor bus	487,459	465,610
Total miles operated	5,013,084	5,004,125
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.723	2.4
Accidents per 10,000 bus-miles	1.785	2.92
Revenue passengers carried per accident	20,820	16,820
Average number of witnesses per accident	3.5	2.8
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	22	37
Employees complained of by car riders	109	128
Car defects reported per 10,000 car-miles	5.1	5.0
INFORMATION ABOUT POWER		
D.c. kw.-hr. output gross per month	28,009,810	28,415,500
Maximum kw. load	85,480	85,870
Tons of coal consumed for power	22,710	24,095
Lbs. of coal for power per d.c. kw.-hr. at cars	1.820	1.903
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	0.819c	0.803c
Per revenue car-mile	4.70c	4.86c
Kw.-hr. per revenue car-mile	5.733	6.054

Feb. 21, 1928 EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY
CO-OPERATION

Volume 7 MARCH, 1928 Number 3

Boston Elevated Close-Ups



THE TOWERMAN

(See Page 38)

To All 'El' Employees

THIS is the day of salesmanship—in some quarters, of "supersalesmanship." Our industries have learned to manufacture vast quantities of their products with the aid of modern machinery, and these products must be marketed. Salesmanship is an essential part of the marketing process.

What is true in the industries is true in the utilities. Utilities have services to sell, whereas the industries have material products to sell. Utilities are producing services of superior quality, but are meeting sharp competition.

In transportation the competition comes from the automobile. We must demonstrate to the public that our service is superior to the automobile for certain purposes. It would be foolish to argue that the automobile does not have its place. It does have a distinct and extremely important place in our social organization. The electric railway and the passenger bus also have their place, and it is a larger place than they at present occupy. Salesmanship of transportation is necessary to secure the business which legitimately belongs to the railway car and bus.

Three practical questions confront us:

1. What have we got to sell?
2. How are we selling it?
3. What can we do to increase the sales?

Every employee should be able to answer these questions to his own satisfaction. If he will develop himself as a salesman he will help insure the future of the electric railway business.

Edward Dana

Work Car with Plow Attachment for Use on Dorchester Rapid-Transit Extension

SNOW FIGHTING ON RAPID-TRANSIT LINES

While of a Different Character, Snow and Sleet Removal Is as Important on the Rapid Transit Lines as on the Surface Lines—Details of the Problem and How It is Met Are Given in This Article

SNOW fighting on the Boston Elevated Railway is usually associated with the trolley lines, but the rapid-transit lines too have their snow-fighting problems. While these perhaps are of lesser magnitude, special snow-fighting equipment and methods peculiar to third-rail operation and the location of the tracks on an elevated structure are necessary.

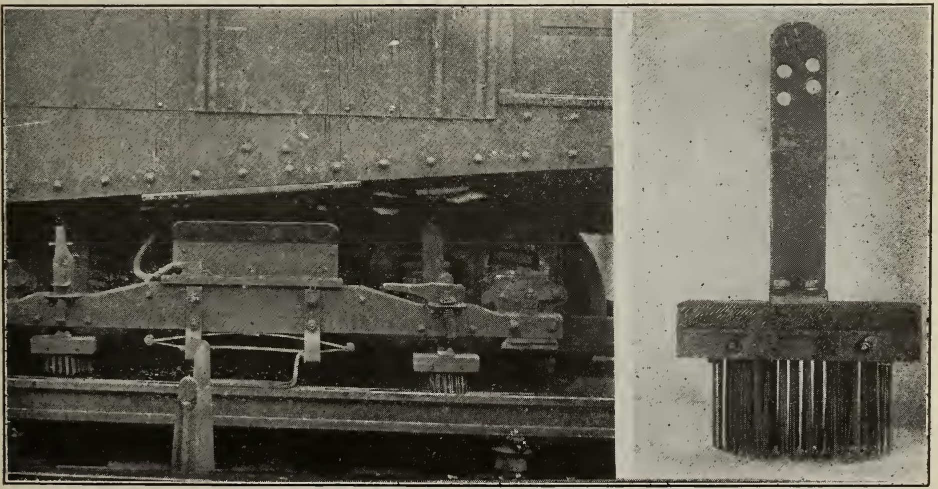
The opening of the Dorchester rapid-transit extension presented a new problem in snow fighting, and snow plows have been provided to be attached to a motor work car for plowing the line when necessary.

At the beginning of a snow storm the maintenance division of the rapid-transit lines assigns men to cover switches at junction points, in yards and terminals, and at other locations requiring special attention. Also, men are assigned to assist station attendants in keeping station platforms and stairways clear of snow and ice.

At the finish of the storm the snow is removed from yards, station roofs, subway and tunnel approaches, the East Cambridge viaduct and the Lechmere Square terminal, as required.

The accumulation of snow on car roofs is removed to prevent the formation of dangerous icicles and interference with the operation of car doors. For safety and convenience in quickly removing the snow, small platforms are erected on either side of one of the tracks in the Sullivan Square yard and men with brooms quickly remove the snow as the trains are run by the platforms.

Immediately following a storm a flat car with special brush equipment is run over the line from Everett to Forest Hills to clear the structure of snow. To



At left—Third-Rail Shoe Beam, Showing Snow Brushes. At Right—Snow Brush, with Holes in Stem for Adjustment.

allow snow to remain on the structure during thawing and freezing periods would tend to cause icicles to form and hang from the structure. An accumulation of ice and snow on the structure would also make conditions unsafe for track walkers and inspectors who have occasion to walk the structure. There are times during sleeting and freezing storms when these men are required to wear ice creepers.

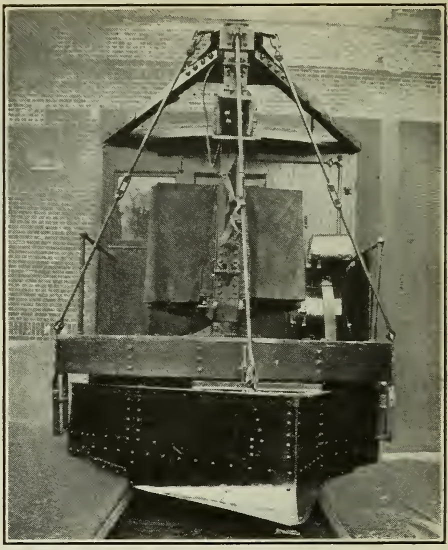
To prevent the formation and accumulation of sleet on the third rail, all the elevated and Cambridge-Dorchester cars are equipped with eight sleet or snow brushes each, two attached to each third rail shoe-beam, so arranged that they can be lowered onto the third rail when needed. The brush head is of hard wood 8¼ by 3½ inches in size, in which are set 540 flat steel bristles which project 3-⅝ inches and are on a bevel.

When not in use the brushes are elevated about 1 inch above the third rail. When they are lowered into position on the rail a spring arrangement provides about 40 pounds pressure. The brush equipment is installed on the cars about Nov. 15, and removed about Apr. 1.

In addition to the passenger cars, four flat cars on the elevated line and four flat cars on the Cambridge-Dorchester line are equipped with from five to seven snow brushes on each shoe-beam.

The flat cars are pushed ahead of the passenger cars and are used only in severe storms.

Liquid Fire Burner Used in Removing Snow from Third Rail



End View of Work Car with Plow Attachment

If the accumulation of sleet should get beyond the capacity of these sleet brushes, hydro-carbon oil burners are used for burning off the sleet. Hydrocarbon oil is sometimes called "liquid fire." It is a by-product of Pintsch gas and is approximately four times as inflammable as gasoline. When ignited it gives off an intensely hot flame and will quickly melt sleet or ice on the third rail or track switches. An accompanying illustration shows its application to the third rail.

The oil containers, or burners, have a capacity of approximately 3 gallons each and are equipped with a long pipe nozzle with a suitable control valve. These burners are located at all yards, terminals and towers. Owing to the highly inflammable nature of the oil, extreme care is taken to isolate this equipment from buildings and like structures.

WHY RAILWAY FARES DIFFER

The whole question of rates of fare is a complicated one due to the fact that the kind of ride which is given for a fare differs greatly in almost every community.

We do not expect all suits of clothes to bring the same price, because there are differences in cost of manufacture and materials utilized. This is equally true with respect to street-car rides.

Boston has more rapid transit in proportion to its population than any other American city and, as the car rider carries the full burden of this, it is necessarily reflected in the fare required in Boston. Again, in Boston once a passenger has paid a 10-cent fare, he can transfer from rapid-transit to surface cars or buses, and vice versa, without additional fare. Observation shows that in Boston each revenue passenger transfers at least once in making his journey. This is a far higher percentage than the average. The transfer rides increase the length of haul and are a factor in the Boston fare.

It is obvious that it would be unfair to compare different cities as to rates of fare without due consideration of all facts. Until one knows the five fundamental factors which control the rate of fare it is really impossible to make a direct comparison. These factors are:

1. The rate of speed attained.
2. The wage rates.
3. The average length of haul of passengers carried.
4. The density or riding habit.
5. The investment at the disposal of the car rider.

EDUCATIONAL SEASON CLOSES

As this issue of "Co-operation" is being distributed the final meetings in the various educational courses are being held or have been already held. The season has been the most successful in the series so far as measured by enthusiasm and sustained interest. The following table gives the approximate number of persons registered in the different courses. There have, of course, been some withdrawals and a number of those registered did not attend a sufficient number of exercises to warrant the granting of certificates.

Automotive Maintenance	140
Foreman Training	192
Public Speaking	19
Everyday Law	281
Fabric Painting	30
Group Conferences	416
Co-operative courses with Boston Edison Company	65

The program will formally end with the closing exercises on May 3, at which the principal speaker will be Dr. Payson Smith, Commissioner of Education, State of Massachusetts. Invitations to these exercises will be extended only to those who have completed one or more of the courses.

Although not directly a part of the educational program, the Supervisors' Association organized this year was the outstanding event of the season. It is an outgrowth of the foreman conferences and it is expected that the committee on education of the Railway will award certificates to the members of the Association who have attended the meetings regularly. There are approximately 450 members of this association.

CAMPAIGN FOR CANCER CONTROL

From April 23 to 27 a state-wide campaign for cancer education will be held in which the Massachusetts Department of Health, the Massachusetts Medical Society and the American Society for the Control of Cancer will take the lead.

One of the reasons why so many people die of cancer lies in the fact that the disease usually exists for some time before it is properly treated. Therefore, everybody should learn what the first symptoms are and what to do when they are believed to be present.

Any lump, especially in the breast, which comes and remains for some time without satisfactory explanation, should be looked upon with suspicion.

Any sore that does not heal—particularly about the tongue, mouth or lips—is suggestive of cancer. Sometimes the tongue or other part of the mouth is the place where a cancer begins. Beware of the spot where a broken tooth or ill-fitting dental plate has rubbed until a sore has resulted. When any one of these conditions is found go immediately to a capable physician to make sure of the diagnosis. It may not be cancer, but if it is that trouble, your action may prevent very serious consequences.

Any irregular bleeding or abnormal discharge from any of the orifices of the body is a danger signal which should be promptly heeded.

Steps have recently been taken to provide opportunity for everyone who has a suspicion that he may have a cancerous growth to secure sound medical opinion at little or no cost.

Special cancer clinics in Boston are to be found at the Massachusetts General Hospital, the Boston Dispensary, the Huntington Memorial Hospital, the Palmer Memorial Hospital and the Free Hospital for Women.

APHORISMS

From the Houghton Line

Ambition only leads to success when it results in doing rather than in mere wishing.

Because you have heard some one else say something that you desired to be true is no proof of its truth.

If the policy be not just it is a bad policy.

To live above one's income is to live below one's ideals.

It is more important to make people think than to educate them.

ELEVATED CLOSE-UPS

The Towerman

(See illustration on front cover)

IT is the towerman who routes the trains over the switches and special work at terminals and junction points of the rapid-transit lines; he operating the levers of an electro-pneumatic interlocking machine located in the tower and controlling the switches and signals of the plant in his charge.

The normal position of the signal levers is in the neutral, or danger position, causing the signal lights to show red. The signals are cleared, allowing trains to proceed after the switches are properly set for the desired route.

Immediately after the passage of each train the signal levers are returned to neutral position, signal lights red, protecting the train just passed as well as the movement of another train over a conflicting route if such movement is next in order.

Trains are never flagged by interlocking signals except upon instructions from the towerman.

Each tower is equipped with a whistle of a tone distinct from those in use on trains, to be sounded only in case of a signal being disregarded or other emergency. When a tower whistle is sounded, motormen within hearing are required to make an emergency stop, proceeding only upon receipt of proper notification.

Delays, defective apparatus or unusual conditions are promptly reported by telephone to the train dispatcher at the superintendent's office.

At Tower C, Keaney Square, upon the passage of each northbound train the train number, route and time are written upon the plate of a teleautograph transmitter, which transmits the writing to receiving sets in the dispatcher's and starter's offices at Sullivan Square, to Tower A at Sullivan Square, and to Tower M at Everett, thus giving advance information at all these places simultaneously.

Another teleautograph transmitter is operated at Tower D, Washington and Mott Streets, recording the passage of southbound trains, with receiving sets at the starter's office and Tower H at Forest Hills, and in Tower F at Dudley Street.

At towers where drawbridge locks and signals protecting bridge openings are controlled, towermen must understand all special instructions regarding the operation of the bridge to which they are assigned and co-operate with the bridge engineer for absolute safety with a minimum of delay to either river or Elevated traffic.

At Tower C, Keaney Square, during the maximum rush hour, between 5 and 6 p. m., there are scheduled at present twenty-five trains to, and twenty-five from Washington Street tunnel, each having seven cars; and eight trains to, and eight from Atlantic Avenue, each having four cars, a total of sixty-six train movements per hour, averaging a train movement about every 54 seconds.

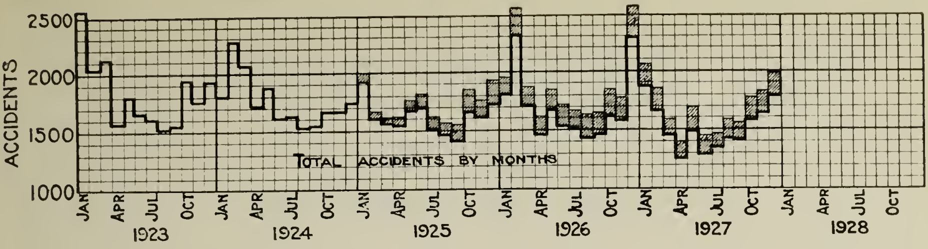
There is a force of 43 towermen employed on rapid-transit lines, operating ten towers. Until a few years ago the telegraph was used, but it has now been discontinued and knowledge of telegraphy is no longer a requirement.

ACCIDENT SITUATION ENCOURAGING

On page 39 are graphical records showing the accident situation back to the beginning of 1923. These charts are revisions of those appearing in the issue of "Co-operation" for January, 1927. They have not only been brought up-to-date but have been redrawn so as to exclude miscellaneous accidents in calculating the accidents per 10,000 miles. In the former chart of accidents per 10,000 miles all accidents were included. The present chart corresponds to the data as given on the last page of "Co-operation" each month. As before, the top chart of accidents covers all accidents, the shaded areas representing the bus accidents and the unshaded areas the car accidents.

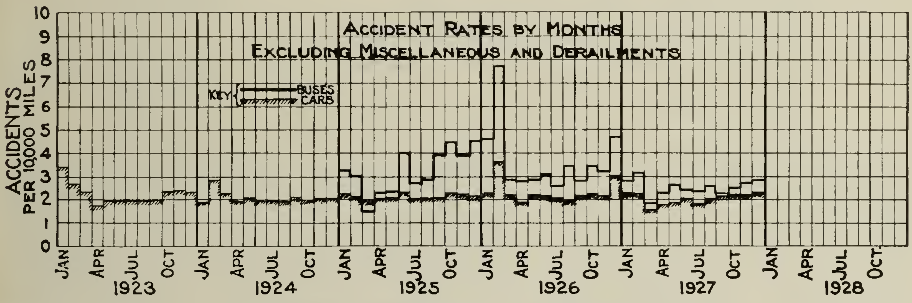
In general the accident record shows improvement, particularly the bus record. Bus accidents per 10,000 miles are now only slightly higher than car accidents. The average for car accidents appears to be about two per 10,000 car-miles while the bus accidents average around 2-1/3 per 10,000 bus-miles.

The charts do not continue beyond December, 1927. Since that month there has been a notable improvement. During the two months, January and February, there were 3,114 accidents in 1928 as compared with 3918 accidents in 1927, a difference of 804, or 20.5 per cent. This is a substantial reduction.



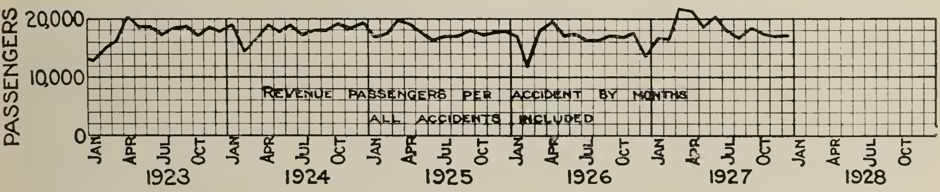
BOSTON ELEVATED ACCIDENTS FOR FIVE YEARS

In this chart are shown the seasonal fluctuations in accidents and the general tendency to improvement. The unshaded areas show the car accidents and the shaded areas the bus accidents. The top line, of course, is the total. In general, August and September are the best months. Then the railway traffic is light and there is less interference with the movement of cars than at other seasons. The better showing for the summer months last year was in part due to the reduction in service. No bus accidents are shown before 1925 as there were not enough buses in service to warrant a separation of the data.



ACCIDENT RATES OVER A FIVE-YEAR PERIOD

By dividing the total of accidents by the number of miles of operation the accident rate as shown is obtained. Car accidents are divided by car-miles and bus accidents by bus-miles. The chart shows a fairly steady rate for car accidents over the period covered, not far from two accidents per car-mile. In the early days of the bus the records were not so good, although in one early month, March, 1925, the bus beat the car. The worst bus-accident month was February, 1926, the month of two severe blizzards. Now the bus record is nearly as good as the car record.



REVENUE PASSENGERS PER ACCIDENT—TOTAL

If the total revenue passengers carried in a month be divided by the accidents occurring in that month the rate plotted above is obtained. Obviously the more passengers carried per accident the better the record. Three times last year did this rate pass the 20,000 mark, a sign of improvement. There was a notable improvement last year in passengers carried per accident.

BOARD OF PUBLIC TRUSTEES
BOSTON ELEVATED RAILWAY

PLANT IMPROVEMENTS

(For similar statement for preceding year see issue of "Co-operation" for April, 1927, page 58)

There has been expended by the Trustees between July 1, 1918, and December 31, 1927, approximately $38,375,000 upon road and equipment, either for entirely new property or for replacement of worn-out property. This amount has been expended to provide facilities necessary for the efficient and economic operation of this railway, as follows:

Cars and motor buses	$18,779,000
Car houses, shops and garages	6,288,000
Power houses and transmission of electricity	4,587,000
Surface lines (track and line betterment)	5,350,000
Elevated structures and appurtenances	2,128,000
Miscellaneous improvements	1,243,000
Total	$38,375,000

When added to the total of $3,434,000 which had been expended upon road and equipment in excess of any capital issues at the time the Trustees took charge of the railway property on July 1, 1918, it made a total to be provided for during the first nine and one-half years of Public Control of approximately $42,000,000.

The money to provide for such betterments came from the following sources:

Part of the proceeds from the sale of preferred stock which the stockholders were compelled to subscribe before the Public Control Act could take effect	$ 2,000,000
Proceeds from the sale of the Cambridge Subway to the Commonwealth	7,868,000
Available from the depreciation charge July 1, 1918, to Dec. 31, 1927	21,680,000
Approximate amount received in settlement of fire insurance losses	1,000,000
The approximate cash proceeds resulting from the sale of real estate properties	1,850,000
Additional bonds issued against the preferred stock which was sold under provisions of the Public Control Act	3,000,000
Additional Boston Elevated bonds issued February 1, 1927	1,926,000
Capital provided to Dec. 31, 1927	$39,324,000

SAWYER AT GENERAL MEETING

Former President of American Electric Railway Association Was Speaker at Joint Meeting of Supervisors' Association and Other Employees. He Paid Tribute to the Elevated for Its Efficiency and Explained Duty of Employees in Promoting Good Public Relations and in Exhibiting Spirit of Loyalty

THE only general meeting in the educational program for the season was held on March 14. This was a joint meeting with the Boston Elevated Railway Supervisors' Association and was presided over by the general manager. The principal speaker was W. H. Sawyer, president of Stevens & Wood, Inc., New York, recently president of the American Electric Railway Association and of the East St. Louis & Suburban Railway. An abstract of Mr. Sawyer's remarks is given below. Following the address Mr. Dana read a recent editorial from the Boston Herald complimenting the Railway upon the record made during the past eight years and attributing it to a spirit of co-operation. This is reproduced on page 43.

Announcement was made by Major A. G. Reynolds, chairman of the maintenance department group conferences, of a dinner meeting to be held Thursday, March 29, at 6:30 p.m., at which Trustee E. E. Whiting will be the principal speaker. Tickets for the dinner may be obtained by any employee upon application to Major Reynolds.

President J. M. Patten of the Supervisors' Association announced as the program for the April meeting of that Association a motion picture lecture with startling experiments, entitled, "Oxygen—The Wonder Worker." There will be other entertainment features.

The program closed with a motion picture depicting scenes from current history from 1911 to 1925.

Abstract of Mr. Sawyer's Remarks

In opening his remarks Mr. Sawyer said that he generally feels at home among electric railway men and felt particularly at home with the group before him. He had, he said, served his time in the carbarn pit and also as a line foreman and a track boss. He had worked on both ends of a street car and had, in fact, been through all the fundamentals. As a result he realizes the trials

BOARD OF CONTROL—SUPERVISORS' ASSOCIATION

Sitting, left to right, J. L. Troy (transportation), secretary-treasurer; J. P. Banks (transportation), vice-president; J. M. Patten (rolling-stock and shops), president; E. L. Doyle (power), vice-president; Thos. Kivell (maintenance), vice-president.

Standing, left to right, W. H. Barnes (maintenance); J. A. Smillie (rolling-stock and shops); C. H. Dey (power); P. E. Maw (transportation), all members of board of control.

and tribulations, as well as the aims and ambitions of the electric railway employee.

He asked his hearers if they appreciated the high position which the Boston Elevated Railway occupies and how great is their good fortune in being associated with so outstanding a group as the Boston Elevated group. "Why," he asked, "Is this Boston Elevated group so outstanding? Is it because they are so efficient? Yes. Is it because they have shown initiative? Yes. Is it because they are desirous of doing a good job? Yes. Is it because of most able leadership and interest in the employees? The answer to all such questions is an unmistakable yes."

"But we must go further to seek the underlying reason. I believe the foundation stone of your success is expressed by the name which you have given your monthly magazine 'Co-operation.' You might show initiative, you might be most efficient, but it would avail nothing if there were not true co-operation.

"I used to say to my own group of associates that co-operation is really a very simple word. It can be spelled with two letters—'W. E.' In other words our job is a 'we-job,' all of us working together.

OUR DUTY IN PUBLIC RELATIONS

"Now what is the biggest 'we-job' to be done? To my mind there is no more important one than that referred to as public relations. I am not stressing this job because I think that the Boston Elevated is deficient in public relations. I am, however, definitely stating that in the final analysis it is the outstanding job which confronts such an organization taken as a whole.

"There are two reasons for this: First: because, efficiency, initiative, leadership, all avail little if the public does not believe in you, if you do not have the confidence and respect of the public, your customers. Second: If you are to have satisfactory public relations you must of necessity have real leadership and the best of relationship with employees. If any of these elements are lacking you cannot have satisfactory public relations.

"What is the individual's duty toward better public relations? It is to be courteous and efficient, to show initiative. But assuming that all of these things have been done, the public, our customers, must have an appreciation of that courtesy, that efficiency, that initiative. Therein lies a duty we owe to ourselves, to our company and to our community. The public looks for information to just such people as are assembled here. You are salesmen for yourselves and your organization. You know that your company is entitled to outstanding respect. You know that it is efficient. You know that it is, within reason, doing the things that should be done to give the best service practicable. You understand the many conflicting and perplexing problems connected with such an undertaking. You know that your officers are honest; you have confidence in them. You have a pride in your work. In short, you know the facts about your company. But do your neighbors, your friends, your associates, know these facts? Do they have an appreciation of the wonderful work this organization is doing? If not, you are failing in your duty to yourself, your company and your community. The Elevated has more than 8600 employees. If every one of these were doing his full duty toward bettering public relations, doing his duty as a well-posted citizen of the community, you would have no public relations problem.

TIMES HAVE CHANGED

"There was never a time when good public relations were as important as today. This is a different day from earlier days in many ways and the public ought to understand this. The public should understand that if this company were not efficient it could not give the service it gives for a 10-cent fare. The public should know that increase in efficiency of operation has made this possible. The public should know that your total operating expenses are less than they were eight years ago in spite of the large increase in wages; that this railway is carrying nearly 10 per cent more people than eight years ago; that the railway is operating more than 10 per cent more revenue mileage. The public ought to know that delays to service and car defects are appreciably less than at any previous time.

"Statistics have been published covering all of these facts; the railway is frank and open in its publicity. But the employees have an opportunity for helpful constructive work by spreading such information.

"The public should understand, also, that in spite of more efficient operation, the financial problem confronting the Boston Elevated is a serious one, requiring community co-operation to the utmost, if the community needs are to continue to be served properly.

"You realize that I am not giving you any 'high-brow' advice, I am not telling you anything new. I am simply talking to you as I would talk to my own associates, because we all need every impetus we can get to cope with the problems confronting us. I realize that in spite of all that we can do there will be complaints, but we can minimize them in number and in tensity.

WAS LINDBERGH LUCKY?

"Some people feel that the world is divided into two classes: the lucky and the unlucky. I do not agree with them. If we get anywhere in this world it is due mainly to perseverance, initiative, foresight and hard constant work rather than luck. Good luck is never a prominent factor in an average man's life. Some people call Lindbergh lucky. True, the element of chance entered largely into his success, but even in an exceptional case like his, luck was not the prominent factor. Lindbergh had real ability for his undertaking. Without this he would have gone to his death if he had depended on luck. Lindbergh has character, initiative, belief in himself. He is willing to work to the extreme.

"No, generally and broadly, we get what we deserve."

Mr. Sawyer illustrated the above by the story of a colored man who was trying to harness a kicking mule. He surprised his friends by his ability to do this without getting kicked and he explained his success by stating that when the mule kicked he was not there. In other words, he shifted his position. This is what needs to be done in our business.

Another colored man prayed for a chicken, but later he found that it was more satisfactory to pray to be sent to a chicken. Disclaiming any condoning of chicken-stealing, Mr. Sawyer pointed out that luck and success do not come to one. We must go to them.

Loyalty a Cardinal Virtue

"I can excuse a man who is sometimes lazy or grouchy, but disloyalty is to me an unforgivable sin. You may not be disloyal, but that is not enough. You must be loyal. Putting it bluntly we must have confidence in, and be loyal to our business associates, our industry, our railway. To be truly loyal one must have pride in his work. I am proud of my profession and my industry because I know that we are essential to the progress of the community. You would not be here if you did not feel the same way, but I want you to appreciate the wonderful opportunities you have here."

Observations Abroad

In conclusion, Mr. Sawyer gave some results of observations in Australia and Havana, Cuba. He said that Australian public utilities are publicly owned, necessarily so because the country is so large and the population so sparse. Australians are honest in money matters. In Australia jitneys were just appearing and the competition from private automobiles had not amounted to much. Injury and damage claims amounted to little due to the absence of ambulance-chasing lawyers, who are disbarred.

Havana is in the throes of jitney troubles, but in matters of accident claims the situation is favorable for the railway, because the Courts rule that the car cannot dodge other vehicles. Hence, it is up to the other vehicles to dodge the car. In one statement quoted by Mr. Sawyer the local railway collected more in damages from owners of other vehicles than was paid out to such owners.

1920—THE ELEVATED—1927

(Reprinted by permission from Boston Herald of March 7, 1928)

The management of the Boston Elevated have tabulated in parallel columns some of the most important operating statistics of the system for the years 1920 and 1927. The comparison is so greatly to the credit of the men who actually operate the road—the men in the offices and the men who run the cars and keep the track and the wires in order—that we place here the principal items in the parallel in the hope that all our readers will scan the statement and bestow their applause where applause is due.

Fares—The average fare per revenue passenger has decreased from almost 10 cents to a little more than 9 cents.

Wages—During this eight-year period the wage increases awarded would have added to the burden of the car riders no less than $4,000,000—had it not been for the economies effected. Due to those economies the actual payroll in 1927 was $459,000 less than in 1920. The total paid in wages last year was $16,757,338.

Gross revenues—In 1920, $34,032,000; in 1927, $35,193,000.

Fixed charges—Expended for taxes, rent of leased roads, dividends, subway and tunnel rents, and interest, in 1920, $8,610,000; in 1927, $9,838,000. This means that fixed charges have advanced more than $1,225,000. But, note the next item:

Operating expenses—In 1920, $25,769,000; in 1927, $25,132,000. This means that economies of management have overcome the increase in fixed charges and reduced operating costs by $637,000.

Further—Delays of 20 minutes' duration have been reduced from 885 to 500 per annum; defective cars per 10,000 car miles from 13.4 to 3.8. And "the patrons have $18,750,000 worth of new cars in which to ride."

A fine showing. The management explain it by a single word, a word often used without circumspection but that in this case seems entirely true and just: the word "co-operation."

Knowing just half your subject doesn't help you—it's always the other half you need.—*The Enamelist.*

Well shined shoes and polish often go together.—*The Enamelist.*

REAL-ESTATE LAW*

What Sort of Deed Should the Buyer Expect? Rights Which One Man May Have in the Land of Another. How Should Husband and Wife Hold Title Together? Mechanics' Liens

By E. M. BROOKS, ESQ.,

Assistant General Counsel, Boston Elevated Railway

KINDS OF DEEDS

A *WARRANTY DEED* is a conveyance, plus a guaranty by the seller that the title to the land is perfect, except for any incumbrances which the seller expressly mentions in the deed and which are of course taken into account in fixing the price paid.

A *quitclaim deed* is a conveyance, plus a milder guaranty by the seller, that the seller himself has done nothing to impair the title; he does not guarantee the title to be perfect. But in this part of the state the quitclaim deed is used in most sales. This is best for the seller; it does not impose on him a responsibility which may cause him trouble in the future. It is sufficient for the buyer; he is going to have the title examined anyway at his own expense, and if the title is good, a quitclaim deed will pass it on to him, and if it isn't good, he won't wish to take it, no matter how strong the deed.

A third kind of deed is the *release deed,*—without any guaranty,—used not to convey the main title, but to release some claim outstanding in some person other than the seller, which might or might not cause trouble if not thus cancelled.

WHAT IS IMPLIED IN A SALE

When a buyer is ready to make an offer for a piece of land, is a good time for him to consult his lawyer, to have his guidance in making the contract of purchase, which may not result in a deed till ten days or a month later. If the seller merely contracts to "sell" the land, the law adds the implied provision that he must give a good title. But the law does not imply a requirement that the seller must give a warranty deed. If the buyer wishes a warranty deed, he must bargain for it. If there are any mortgages, attachments, building restrictions, etc., the seller is required to mention them, and the honest seller will do so.

WHAT IS INCLUDED IN A SALE

A deed of land carries title to any buildings thereon, though not mentioned. It also carries any rights of way or similar rights that are appurtenant to the lot of land conveyed. If the seller owns a piece of land running back from a street and sells off some back-land, not abutting on any street, and no mention is made of any right of way giving the buyer access to the street, the law creates a right of way for him, and calls it "a way of necessity." The seller must point out for the buyer a reasonable route over the seller's remaining land, and if the seller fails to act, the buyer can himself select such a route.

INSURANCE

When any buildings are included in a conveyance of land, the transfer of the fire insurance by the insurance company agents should be attended to forthwith. It is a maxim of insurance law that the insurance should follow the title. If this is overlooked, and a building burns down, and the insurance company stands on its rights, the insurance is lost. The buyer can't hold the insurance company, as he never acquired the insurance policy. The seller can't hold the company, as he no longer has an "insurable interest," i. e., no longer has any property to protect by insurance.

RECORDING THE DEED

It is a good plan to have the deed delivered, the price paid the insurance policies transferred, at the Registry of Deeds, (1) in order to be sure that no attachment by a creditor of the seller is put on record between the time when one's lawyer has reported favorably on the title and the time of paying over the price, and (2) in order that there may be no uncertainty as to the taking effect of the deed or as to the time of its taking effect. Deeds take effect when delivered by, or with the authority of, the seller, to the buyer, or on some equivalent formality. If a deed is not recorded, there is more ground for a claim, by interested persons, that it was never delivered and made effectual by the owner.

EASEMENTS

An easement is a right which one owner has in the land of another. Such a right is usually appurtenant to land adjoining the land in which the right is claimed. The common instance is the right of way, a right which a man often has, by a grant in black and white, under seal, or by long-time custom, to "pass and repass" over his neighbor's land. Another easement, or natural right, is the right of suport.

RIGHT OF SUPPORT

This right exists, commonly without any writing, as between adjoining owners. An owner has the right, as against his neighbor, to have his land, *in its natural state*, supported by his neighbor's land. This means that his neighbor must not excavate right up to the boundary line, without making provision to prevent the first man's land from falling into the pit. If the neighbor does excavate without precaution, and damage is done, he must pay the damages. But such damages are not great, because the neighbor's duty does not extend beyond leaving his land to support the first man's land *in its natural state.* The neighbor and his land are not charged with any duty as to the support of the first man's buildings. The result is this: that an owner who builds up to the boundary line must take his own measures to secure the permanence and sufficiency of his own foundations, and if his neighbor starts excavating, the first man must attend to the shoring and protection of his own building.

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*Abstract of the fifth lecture in the course in Everyday Law, F. W. Casey and E. M. Brooks, committee in charge, delivered at Franklin Union and Sullivan Square, Monday, Jan. 9, 1928.

PARTY WALLS

In congested sections, where with a twenty-five foot frontage of a brick block, the saving of a foot of frontage means the saving of four per cent of the potential floor area, party-wall agreements are common. Without such an agreeement, in writing and under seal, an owner would be very foolish to insert his timbers in the side-walls of his neighbor's building. It is not a situation for gentlemen's agreements. A later owner may not be so agreeable. Under the common form of agreement where a division wall is used in common by adjoining owners, each owner still owns outright the half of the bricks that are on his own side of the line, subject however to obligation to let them contribute to support his neighbor's building, and he also himself has a corresponding right or easement to have his own building receive support from the half of the wall on his neighbor's land.

SPITE FENCES

It is provided by statute in Massachusetts that an owner cannot lawfully erect against his neighbor's property a fence more than six feet high, for the purpose of annoying his neighbor.

ZONING LAWS

One buying land nowadays should first investigate whether there are any zoning ordinances which forbid his making the use of the land which he contemplates. Building restrictions by private agreement have long been resorted to by landowners developing large areas for residence purposes, but zoning laws, adopted by cities and towns, prescribing that certain districts, as to new construction, shall be reserved for one-family residences, others for two-family residences, and that others shall be open to commercial uses, are recent but valid.

KINDS OF TITLE

A man can own a lot of land for his lifetime, so that he can sell only what is called a "life estate," or he can hold the land as his own absolutely (or, as the law calls it, "in fee simple"), so that he can sell the whole title. Commonly, in this country the legal title is held absolutely, not divided up in "life estates" and "remainders." But if a man wishes to deed his land to his children for life, with "remainder" after their decease to his grandchildren, he can do so, but of course he will first consult his lawyer as to the advantages and disadvantages of so doing.

Where several persons together own a lot of land, they may hold title as "tenants-in-common." That is the usual way. The co-owners then own undivided shares, and on the death of any owner, his share goes to his heirs. Any one of the owners can have the court "set off" his share, so that instead of owning a small share in a large lot, he will own the whole title of a small lot. When a man dies, his heirs take his lands as tenants in common.

Again, co-owners may, if it is desired, hold title as "joint tenants." By this arrangement, if one dies, the whole title remains in the survivors. No share goes to the heirs of the deceased. When large properties are managed by trustees, this is the proper form of title, as of course nobody intends that property held by a group of men merely for purpose of management, shall go to the heirs of the managers. When one manager dies, another will be appointed and will succeed to the title held by the deceased.

A third sort of joint ownership is tenancy " by the entirety," a form which husband and wife may adopt if they wish. But in general I think it is undesirable. If either dies, the survivor takes the whole title. The children take no part of it, unless they later inherit it from the surviving parent. Also, while husband and wife are both living, the husband has the right to let the land to a tenant and collect and retain the entire rent. If the husband is unfortunate in business, his creditors can take his interest in the land,— which means that so long as husband and wife are both living, the husband's creditors can take the whole income, and if the wife dies first, the creditors will then hold the whole title, the children being eliminated entirely. If husband and wife are to hold in joint ownership, a better arrangement would seem to be the "tenancy in common."

MECHANICS' LIENS

A workman who performs labor in the erection or repair of a building can have

The General Manager and the 50-Year Men

a lien (or claim) against the land and building for eighteen days' work performed during the forty days next prior to his filing a proper statement in the Registry of Deeds. A contractor who files a notice of his contract in the registry of Deeds can have a lien for all labor and materials furnished by him *thereafter.* Sub-contractors may also have rights. The landowner, before settling with contractors, should take these possibilities into account.

FORTY-FIVE-YEAR MEN MEET

The general manager entertained at luncheon at the Engineers Club on March 19 the men in all departments who had been with the Railway forty-five years or more. The names of the men invited are given in the honor roll on page 47.

There were present all of the twelve 50-year men who attended the luncheon last year (see issue of "Co-operation" for May, 1927, page 70), and one additional 50-year man who entered this class during the past year.

Mr. Dana called the roll of the men invited, by departments, and they responded amidst considerable applause. Mr. Dana paid tribute to the efforts of the men present, during their long careers with the Railway, to co-operate with the management. He said that the results which had been achieved had been possible only through the hearty co-operation of the whole Boston Elevated organization.

James Smith, superintendent of transportation, responded to a toast in which he paid a tribute to the management and referred especially to the pension plan which means so much to the long-service men and which is a result of the present management.

Timothy Connell, supervisor of timetables, also responded, emphasizing the value of the human touch in the management. He said that it means a great deal to the long-service men, as well as to others, to have the personal interest of the management in the men. The present management is notable for this feature.

Group of 45-Year Men at General Manager's Luncheon

BOSTON ELEVATED RAILWAY HONOR ROLL

Men Who Have Completed 45 Years or More of Service

Name	*Occupation*	*Department*	*Entered Service*
Edward Sweeney	Motorman	Transportation	1871
George A. Gilman	Inspector	Transportation	1872
John Carl	Inspector	Transportation	1873
*Henry W. Holbrook	Gateman	Transportation	1873
Patrick Banks	Starter	Transportation	1874
*Frank Holbrook	Operator	Transportation	1874
Timothy Connell	Supvr. of Timetables	Transportation	1875
F. A. McAvoy	Asst. Supvr. of Timetables	Transportation	1875
*Charles E. Seaver	Motorman	Transportation	1875
George H. Robinson	Painter	R. S. & S.	18
N. L. Dorr	Harness Maker	Maintenance	1876
John Howard	Inspector	Transportation	1876
*Michael Long	Motorman	Transportation	1876
*G. H. Lewis	Operator	Transportation	1877
John B. Kirby	Machine Spec.	R. S. & S.	1878
*H. P. Tully	Motorman	Transportation	1878
C. I. Chadbourne	Warder	Transportation	1879
*James H. Donlan	Motorman	Transportation	1879
Patrick H. Kelly	Warder	Transportation	1879
*Frank H. Jacobs	Motorman	Transportation	1879
Herbert Kingsbury	Clerk	General Claims	1879
Austin Shuttleworth	Inspector	Transportation	1879
*Andrew Blake	Spec. Groundman	Power	1880
T. Devine	Track Cleaner	Maintenance	1880
Asa W. Flanders	Paymaster	Treasury	1880
Denis Kelley	Motorman	Transportation	1880
Harry L. Libby	Coast. Cl. Insp.	R. S. & S.	1880
Chas. E. Peatfield	Foreman	R. S. & S.	1880
John P. Quirk	Warder	Transportation	1880
John Bargin	Car Cleaner	R. S. & S.	1881
T. Dawson	Operator	Transportation	1881
Timothy Galvin	Warder	Transportation	1881
A. L. Hauser	Motorman	Transportation	1881
*James Kenney	Operator	Transportation	1881
Patrick Roach	Inspector	Transportation	1881
*James Smith	Superintendent	Transportation	1881
W. A. White	Operator	Transportation	1881
*George Archibald	Motorman	Transportation	1882
*George Archillis	Motorman	Transportation	1882
*Joseph A. Bagley	Operator	Transportation	1882
C. A. Bauch	Div. Supt.	Transportation	1882
George W. Clark	Motorman	Transportation	1882
John J. Connor	Warder	Transportation	1882
Patrick Cottle	Motorman	Transportation	1882
Michael J. Croke	Watchman	R. S. & S.	1882
*Edward Cousins	Operator	Transportation	1882
Joseph F. Daley	Conductor	Transportation	1882
Patrick Donohue	Car Shifter	R. S. & S.	1882
John J. Donovan	Starter	Transportation	1882
*Michael Gordon	Motorman	Transportation	1882
Alfred J. Gray	Motorman	Transportation	1882
F. E. Hanington	Sta. Master	Transportation	1882
Patrick Manning	Motorman	Transportation	1882
Patrick J. Moran	Nt. Foreman	R. S. & S.	1882
Robert E. Nelson	Motorman	Transportation	1882
*John Sullivan	Motorman	Transportation	1882
William Pett	Sta. Receiver	Treasury	1882
George W. Clarke	Warder	Transportation	1883

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*There were one or more slight breaks in the periods of service of these men, but the total of service was 45 years or more.

CHANGES IN THE RESERVE FUND

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	$186,947.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	236,543.80*	Mar.	256,586.83†
Oct.	2,723.19†	April	181,694.29†
Nov.	29,302.22†	May	113,284.72†
Dec.	234.879.91†	June	92,917.54*

Profit and loss credit.........$137,259.76

Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*	Jan.	$191,381.71†
Aug.	408,570.65*	Feb.	75,469.39†
Sept.	147,204.65*		
Oct.	79,421.56†		
Nov.	34,226.52†		
Dec.	280,536.75†		

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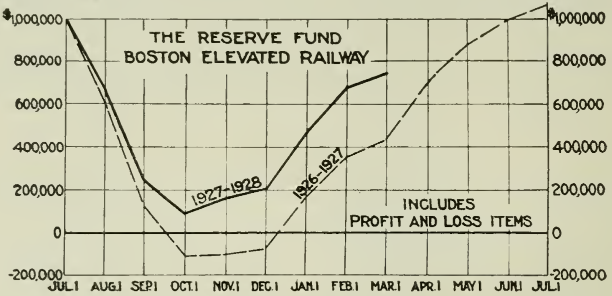
†Excess of revenue over cost of service.

*Excess of cost of service over revenue.



FEBRUARY OPERATION

GENERAL FINANCIAL DATA	1928	1927
Revenue exceeded cost of service	$75,469.39	$92,018.37
Operating revenue per car-hour (A.E.R.A. std.)	$6.44	$6.40
Operating revenue per car-mile operated	63.30c	65.04c
Average fare per revenue passenger	9.264c	9.226c
Ratio operating expense to operating revenue	69.76%	69.15%
PASSENGERS CARRIED		
Revenue passengers	31,170,194	30,853,649
Per cent 5c and 6c passengers	18.95%	18.82%
Revenue passengers per car-mile operated	6.597	6.826
OPERATING FACTS		
Trips operated	599,099	580,311
Car-miles operated:		
Rapid-transit lines	1,359,684	1,200,348
Surface, two-man	1,638,016	1,704,746
Surface, one-man	1,262,099	1,183,014
Motor bus	465,052	431,683
Total miles operated	4,724,851	4,519,791
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.718*	2.287*
Accidents per 10,000 bus miles	1.893*	3.22*
Revenue passengers carried per accident	20,500	16,620
Average number of witnesses per accident	3.50	3.41
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	19	26
Employees complained of by car riders	107	109
Car defects reported per 10,000 car-miles	5.4	4.3
INFORMATION ABOUT POWER		
D. c. kw.-hr output gross for month	27,215,065	25,159,185
Maximum kw. load	86,640	84,170
Tons of coal consumed for power	21,647	21,542
Lbs. of coal for power per d.c. kw.-hr. at cars	1.785	1.882
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	0.782c	0.881c
Per revenue car-mile	4.64c	5.04c
Kw.-hr. per revenue car-mile	5.932	5.723

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*Does not include miscellaneous accidents or derailments.

March 22, 1928 81 EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY CO-OPERATION

Volume 7 APRIL, 1928 Number 4

Boston Elevated Close-Ups

THE MACHINIST

(See Page 60)

To All 'El' Employees

THE topic for last month's editorial message on this page was salesmanship. These three questions were asked:

1. What have we got to sell?
2. How are we selling it?
3. What can we do to increase the sales?

Here are some suggestions regarding the answers to these questions:

We have transportation service to sell, which means getting our patrons to their destination quickly, safely and comfortably. We have the equipment with which to do this as far as the mechanical means are concerned. These means must be supplemented by competence, courtesy and alertness on the part of operators and officials.

We are selling this service largely by making it attractive. The best advertising medium is a pleased customer. Even with nationally advertised merchandise it is, after all, the satisfaction of the customers which sells the goods. This is especially true in transportation.

We are helping to increase our sales by constant improvement in equipment and in attention to every detail that makes our service quick, safe and comfortable. Every employee can help in this. First, he can cultivate his natural talent for selling. Then he can call attention to defects, the removal of which will make the service still more attractive.

Our ideal must be to have each patron experience a sense of satisfaction whenever he uses our service. When possible, in our daily contacts when off duty we should use every opportunity to tell the facts about the Railway. To do this, we must, of course, know the facts ourselves.

In a recent address before Boston Elevated Railway employees, W. H. Sawyer, recently president of the American Electric Railway Association, said that if each of the more than 8600 employees of the Railway were a good salesman the Railway would have no public relations problem. This is a suggestion worth pondering.

Edward Dana

TRACK RECONSTRUCTED ON 18-YEAR-OLD BASE

Same Foreman in Charge of Two Jobs of Track Work on Same Site—One Hundred Men in 1927 Did Work of Four Hundred in 1909—Work Carried on During Regular Working Hours

DURING 1927, the track on Highland avenue, Somerville, was rebuilt from Davis Square to Medford street. The work started on July 5 and was completed on Nov. 12. A total of 17,566 feet of single track was constructed in a little over four months without interfering too seriously with the car traffic. At the same time, the city of Somerville laid smooth pavement in the roadways and between the tracks.

The old track was built in 1909 of 8-inch T-rail. It had thus been in service for eighteen years. The foreman in charge of that work was Alexander T. Stewart. He also had charge of the reconstruction.

The old track had cast-weld joints. In 1909, the necessity of making joints with no openings at the rail ends was not as apparent as in later years. In any event, the cast-weld joints caused a great deal of trouble and the track had to be welded in 1915-16 by the Lorain bar method.

NEW TYPE OF RECONSTRUCTION

The new track is built of 7-1/4-inch T-rail, with beveled ends, and the joints are seam-welded. This is the first occasion that the Boston Elevated Railway has had to use a type of reconstruction considerably used in the Middle West, in which the old concrete base is retained and the new track structure is built on top of the old base.

In this job the granite-block paving was removed with a pavement plow and the blocks were piled up on the side of the street. The old rail was cut to approximately 36-foot lengths for easy loading and the fastenings in the steel ties were burned off. The resulting loose material was loaded with a Barber-Greene snow-loading machine equipped with buckets for suitable handling of material of this sort.

Then the old concrete base was swept clean with a tractor sweeper and wherever the old concrete base showed signs of damage it was patched with fresh concrete. On this base, International twin steel ties from 7/8 inch to 1¾ inches in thickness were laid 6 feet on centers. The rail was fastened to the ties with eight steel clips, spot-welded to the ties. Tie rods 5 feet on centers were installed and the track was held to surface and line by blocks and wedges. The track was anchored to the old steel ties embedded in the concrete, with angle irons, one leg being welded to the old steel tie and the other bent over the base of the new rail after heating with an oxy-acetylene torch. These anchors were applied at intervals of about 12 feet.

A portion of the old track had been built with wood ties and when this was the case, in order to take advantage of the anchoring feature described above, short pieces of the old rail were cut off and embedded in the concrete, head down and base up, the anchors being welded to the old rail.

After the track had been brought to proper surface and line, it was tamped with a dry mixture of concrete, then the concrete paving base was laid covering the steel ties. On top of the concrete base a 1-inch sand cushion was added and the track was re-paved with the granite block which had been removed from the old track, the block previously having been re-cut to approximately 5 inches in depth. The granite block paving was grouted in the usual manner, but lampblack was used in addition so that the color of the grouted pavement would match the color of the roadway on either side.

TRACK REBUILT IN SECTIONS

Had the street been wider, it would have been possible to use a temporary third track, allowing the work to proceed even faster and interfering with the operation of trolley cars very little. However, the transportation department allowed the track to be built in sections about 2500 feet in length, passenger cars being operated in both directions on one track for this length while the track building was going on.

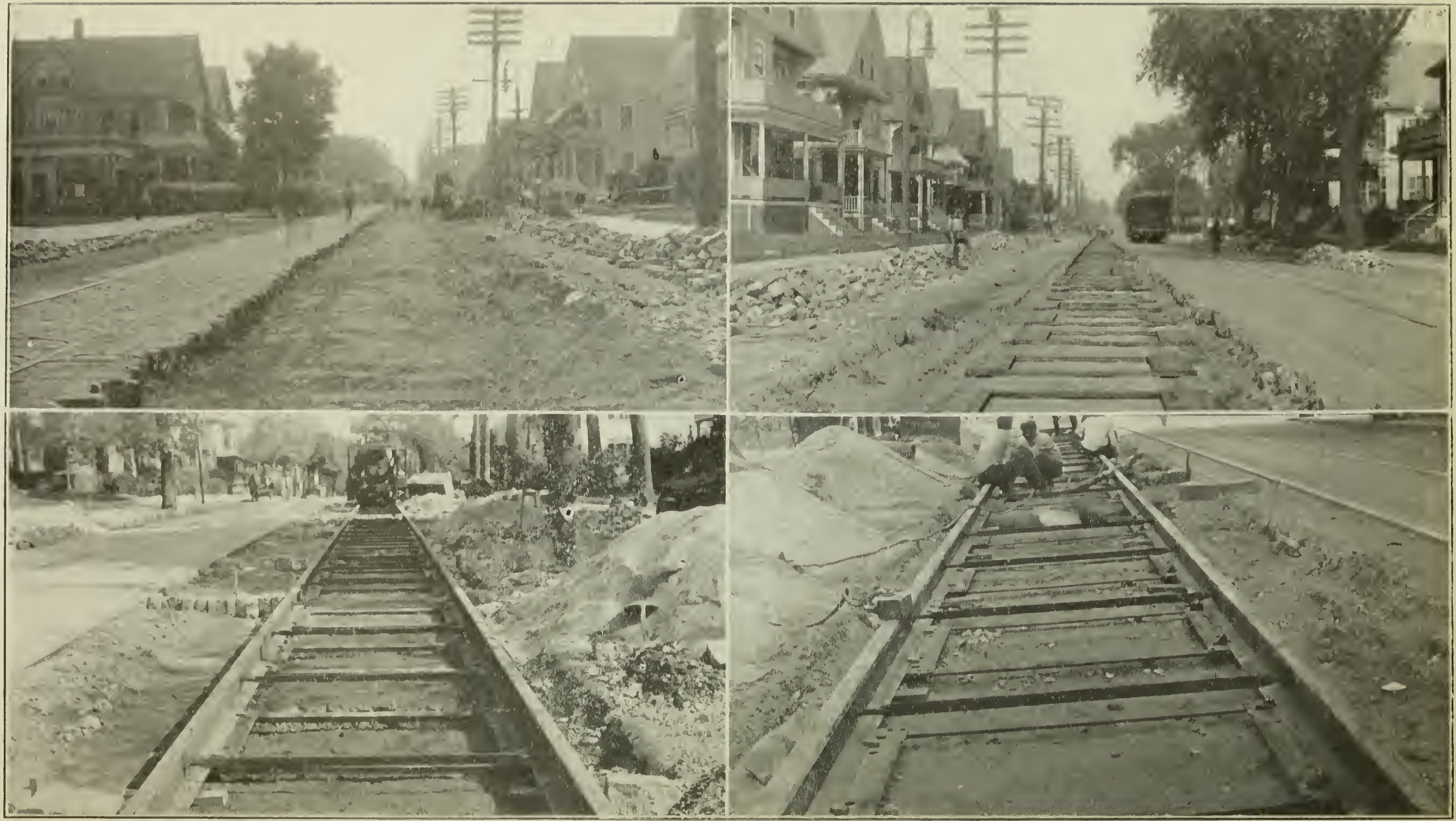
In building this stretch of track the following material was used:

545	tons of 7-1/4-inch T-rail
577	welded rail joints
2,895	International twin steel ties
2,146	tons of crushed stone
2,320	tons of sand
16,916	bags of cement
2,525	pounds of lampblack
455,024	re-cut granite blocks

The work was carried on during the regular working hours and a maximum of 100 men were used. While there are

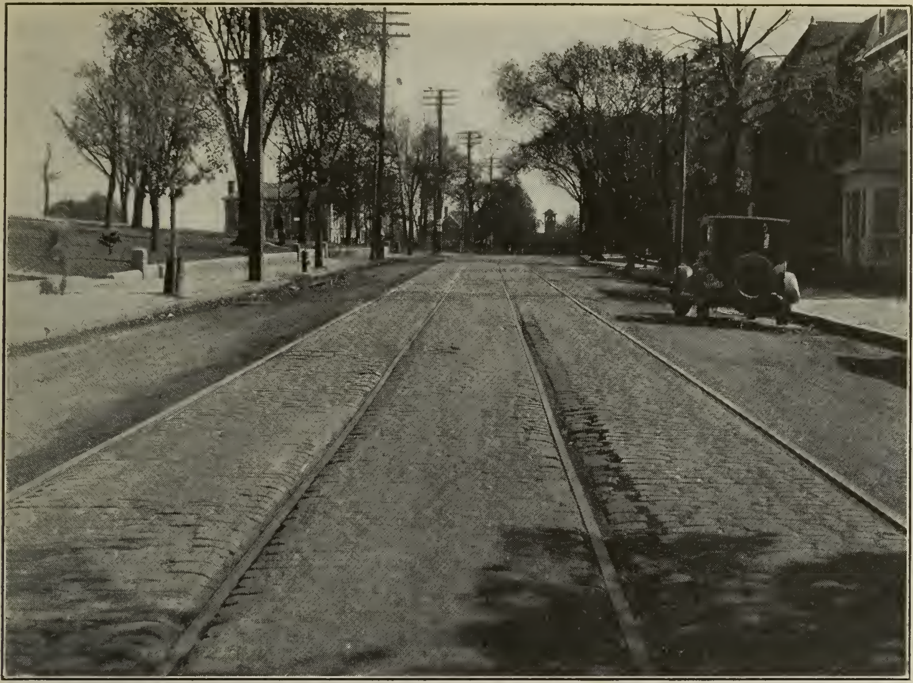
(Please turn to page 61)

The following two pages contain this story in picture form. The pictures show many construction details.

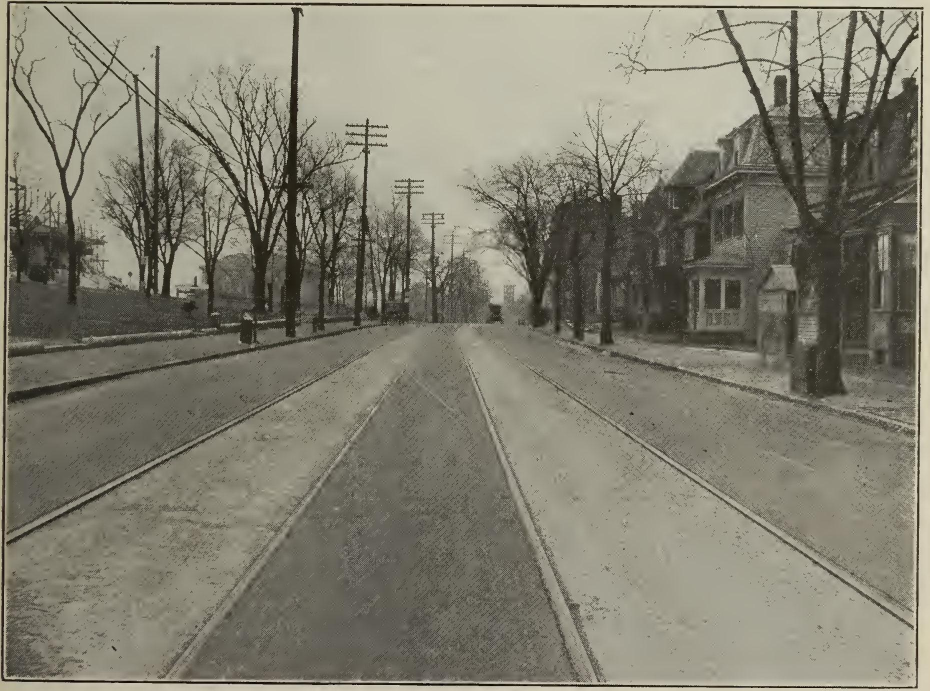


CONSTRUCTION VIEWS OF HIGHLAND AVENUE JOB

Above, old foundation cleared for new track, and same with steel-tie construction started. Below, new track. At left, concreting begun. At right, electric welders at work.



TRACK ON HIGHLAND AVENUE, SOMERVILLE, AFTER 18 YEARS' WEAR



THE SAME TRACK AS RECONSTRUCTED IN 1927

The two pictures were made from approximately the same point

THE LAW OF CONTRACTS*

Explanation Is Given of What a Contract Is, When a Contract Is Binding, What Is the Effect of a Mistake, and What Is Meant by Breach of Contract, in Other Words the Essentials of the Subject Are Covered

By CHARLES B. GLEASON, Esq.
Attorney, Boston Elevated Railway

A CONTRACT is an agreement which the courts will enforce. The courts will not enforce an agreement which the parties did not intend to be enforceable, such as a social engagement.

INTENT

Therefore, for an agreement to be a contract, the first requirement is that the parties intended to create a binding legal obligation.

CONSIDERATION

The second requirement is that there must be a valid consideration moving from each party. The consideration may be money, property, something done or forborne, or a promise to do or forbear doing something. It must be something which the party is not bound in law to do or forbear doing. It need not be a benefit to or "move to" the other party. If the consideration for a promise is something to be done or forborne, the contract is complete when the thing is done or forborne, and not before. Such a contract is called unilateral. If the consideration for a promise is a promise by the other party to do or forbear doing something, the contract is complete when the second promise is given. Such a contract is called bilateral. A promise to pay for past services, rendered without request or the expectation of payment, does not create a contract. A past consideration is not valid.

EXCEPTIONS

No consideration is necessary if the contract is under seal; or if it is a "contract implied in law." A contract implied in law is a legal fiction, recognized by the courts, in order to provide a remedy in a suit on a judgment, or to enforce a statutory liability; or, in some cases, in order to prevent unjust enrichment, as where A pays to B a sum of money that he should have paid to C.

MUTUALITY

The third requirement is that there must be complete mutuality. The parties must agree on the same thing, and in the same sense, and must agree upon all the terms. No term can be left unsettled. There must be also a legal obligation to carry out the contract. If one party is not bound, the other is not bound. The parties may express their intent by words or actions. Secret intentions are of no consequence. If a man's words or acts, judged by a reasonable standard, manifest an intention, that is his intention, in the eye of the law. The rule of mutuality does not apply to contracts under seal.

LEGALITY

The fourth requirement is legal competency of the parties and a lawful purpose. A man cannot make a valid contract with his wife. A contract made by a minor is voidable by him during infancy, or within a reasonable time after he becomes of age. If he elects to avoid the contract, he may recover from the other party what he has paid him, without returning what he has received. A minor's contracts for necessaries of life, however, are binding on him and his property, to the extent of the fair value of the goods or services received by him. A minor cannot disaffirm a deed of land before he becomes of age. A minor is liable for his torts or wrongs, and, if he fraudulently represents himself to be of age, he may be liable for the fraud, if the other party was misled.

Contracts of insane persons, under guardianship, are absolutely void, unless made by the guardian as authorized by the court. A contract of a person of unsound mind, not under guardianship, is voidable, if he was so insane as to be incapable of understanding the nature of the contract, or its probable consequences.

A promise by a corporation in excess of its corporate powers is void. A foreign corporation, doing intra-state business in this state, has only such powers in regard thereto as our state laws permit. Anyone dealing with a corporation is bound, at his peril, to find out what its powers are.

The purpose of the agreement must be lawful. A promise in violation of positive law is void; so is a promise to commit a fraud, or a civil wrong, or one clearly tending to injure public health, public morals, or the administration of the law, or to undermine individual rights. The rule covers gambling agreements, agreements to commit a fraud or breach of trust or duty, agreements in absolute restraint of marriage, and agreements which unreasonably restrain trade. The test of illegality is the evil tendency of the contract, and not what has been done under it.

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*Abstract of the fifth lecture in the course in Everyday Law, F. W. Casey and E. M. Brooks, committee in charge, delivered at Franklin Union and Sullivan Square, Monday, Jan. 9, 1928. Mr. Brooks' lecture, abstracted last month, was the sixth in the course, and delivered Monday, Jan. 23.

Under Federal statutes, any agreement is void, if it tends to reduce competition, restrict production, or increase the price of an article, in interstate commerce.

MISTAKE

Mistakes in contracts sometimes occur. The general rule is that a mistake in fact does not affect the force or validity of a contract. But if it is such that the minds of the parties did not meet, there is no contract. Such may be the case, where the thing, concerning which the contract is made, has been destroyed, unknown to the parties, or where there is a mistake in the identity of one of the parties. A mistake regarding the legal effect of the contract, or the value of the property affected, does not avoid the contract, nor can a party avoid it on the ground that he did not read it, or that he supposed its contents were different. Mutual mistake, in regard to a material fact, may be a ground for relief, in equity, if the plaintiff is not in fault. Relief in equity may be had in case of fraud, also. Non-disclosure of a fact will not constitute fraud, unless there is a duty to disclose, or unless active steps have been taken to conceal the truth. A representation as to some future act which a party intends to do, and does not do, is not a ground for relief; nor are inaccurate expressions as to value, appearance, quality or prospects, or other "trade talk."

OFFER AND ACCEPTANCE

A contract is a form of agreement, hence there must be an offer by one party, and an acceptance by the other, express or implied. The offer and the acceptance may be oral, written, or partly each, except as hereafter stated. An offer is a proposal to enter into a contract. It must be free from uncertainty. It must be accepted in its identical terms. If an offeree changes one of the terms, the original offer is at an end, and a new offer is made thereby by the original offeree. If the offer does not specify every necessary term, acceptance will not complete the contract. If important blanks are left in the form, there is no contract. But if the contract is partially performed, the missing terms may be supplied by the conduct of the parties. If it is a trade contract, the law implies that the offer and acceptance are made with reference to trade usages and customs.

In bilateral contracts, both the offer and acceptance must be communicated to the other party. If the contract is unilateral, the offer must be communicated and notice of acceptance in some form much reach the other party. In either class of contract, the offer may be withdrawn at any time before it is accepted, even when time is given for acceptance, unless a consideration has been paid to hold the offer open. If the offer is not accepted within the time stated, there is no contract. If no time is stated, a reasonable time is implied.

Offers by mail are complete when they reach the offeree. An acceptance by mail is complete when the acceptance is properly posted; the courts hold that the post office is in effect agent for the offerer to transmit the acceptance. The same rule is applied in case of an offer and acceptance by telegraph, but if the offer is by mail and acceptance by telegraph, the contract is not complete until the telegram is received.

The offerer, however, may prescribe in his offer any condition as to place, time and mode of acceptance, and the acceptance must in every respect comply therewith.

STATUTE OF FRAUDS

As a general rule, at common law, oral contracts are valid, but promissory notes must be in writing, and deeds of real estate must be in writing and sealed. Written leases are of partial force and effect without a seal.

By the Statute of Frauds any agreement to sell real estate or create any interest therein, except tenancies at will, must be in writing; unperformed agreements to sell goods or claims of a value of more than $500 must be in writing, unless earnest money is paid to bind the bargain, or partial delivery is made; contracts of guaranty, and contracts which by their terms cannot be performed within a year, must be in writing. A written contract is necessary also in certain suits against the estates of decedents.

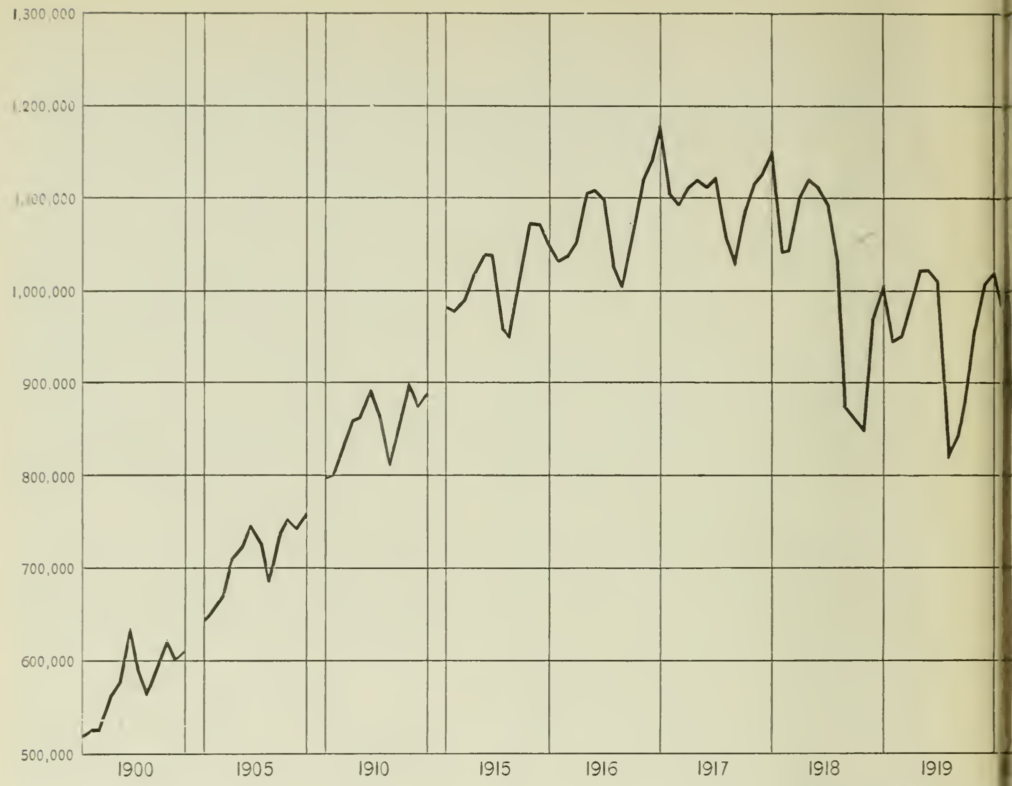
Assignments of copyrights and patents, must be in writing. But oral contracts for labor or personal service, which may be performed within one year, are good to any amount. A contract, required by the Statute to be in writing, may be rescinded by oral agreement.

By the law of evidence, testimony will not be admitted to vary, alter or add to a written contract, which, on its face, appears to have been intended to be a complete contract.

NON-PERFORMANCE

As a general rule, performance must be strictly according to the terms of the contract, but if one party has substan-

(Please turn to page 61)



BOSTON EL

AVERAGE WEEKDA

(INCLUD

CHANGING CHARACTERISTICS OF "EL" SERVICE

Automobile Has Caused a Fluctuating Demand

While the total number of passengers carried on the Boston Elevated system increased from 352,469,586 in 1915 to 366,938,908 in 1927 (reaching a maximum in 1917 of 381,017,338) this does not tell the real story of the volume of business. The interesting thing about it is the change in the character of riding.

On this property, pleasure riding has practically ceased. Business riding has apparently increased. The automobile has taken passengers away on Sundays and holidays and in the summer months. The summer vacation has become prevalent in practically all industries.

The figures of revenue passengers carried given in the next column indicate this:

Average Weekday Passengers (Saturday and Sunday excluded)

	1917	1926	1927	1928
Year	1,073,943	1,086,544	1,079.087	
Aug.	1.002,474	911,098	900,696	
Dec.	1.127.067	1,238,356	1.163,758	
Jan.	1.106.457	1,151,773	1.187,824	1,163,263

Average Sunday Passengers

1917	1926	1927
728,847	576.701	555,326

Average Holiday Passengers

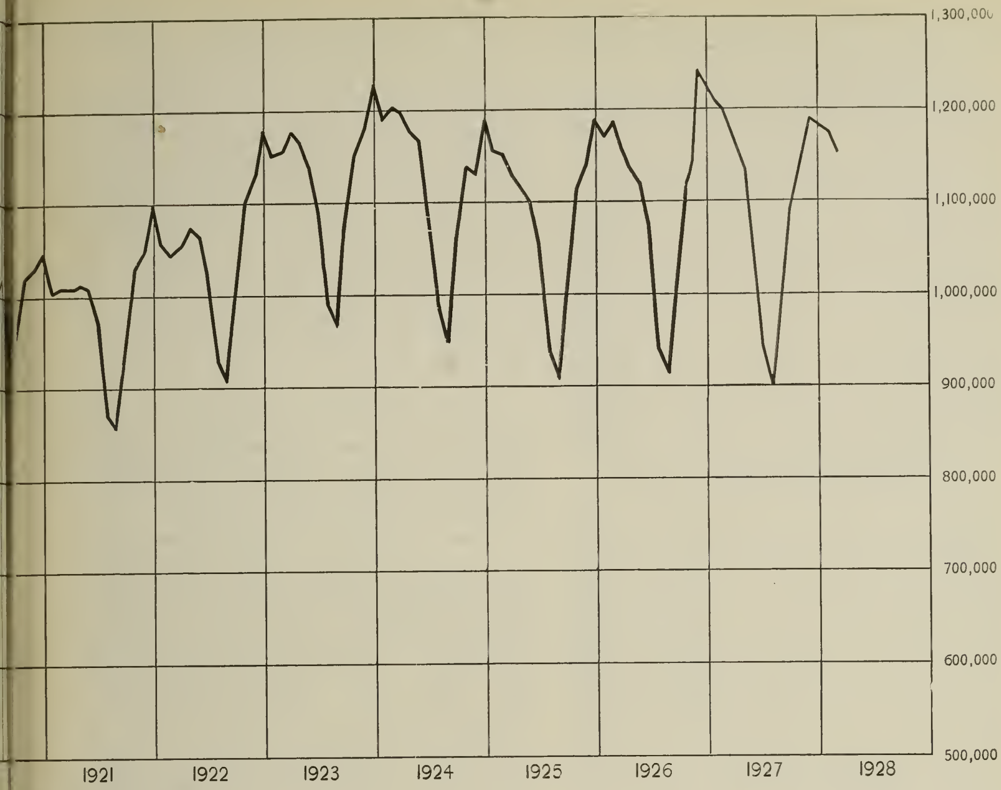
1917	1926	1927
857,902	666.258	661,840

The increased use of rapid-transit facilities on business days is also indicated by other traffic statistics. Count of passengers at Kendall Square station on the Cambridge subway, taken on the following dates, indicates this:

April 1, 1918 (Monday)....	144,256
March 30, 1927 (Wednes.)....	163.462
March 14, 1928 (Wednes.)....	151,920

Table of Passengers Carried in Winter and Summer Months

Month of	1916	1917	1926	1927
January	29,993,264	32,432,168	33,144.528	34,160,787
June	31.163,211	31.943,366	29.831.144	29,167,572
July	30.107,539	31,517,011	27,160,300	26,167,466
August	30.193,058	30,999,846	26,381.206	26,274.417
December	34.029,260	32,839,394	35,474.895	33.644.529
For Year	373.577.908	381.017,338	371.218.401	363.938.908



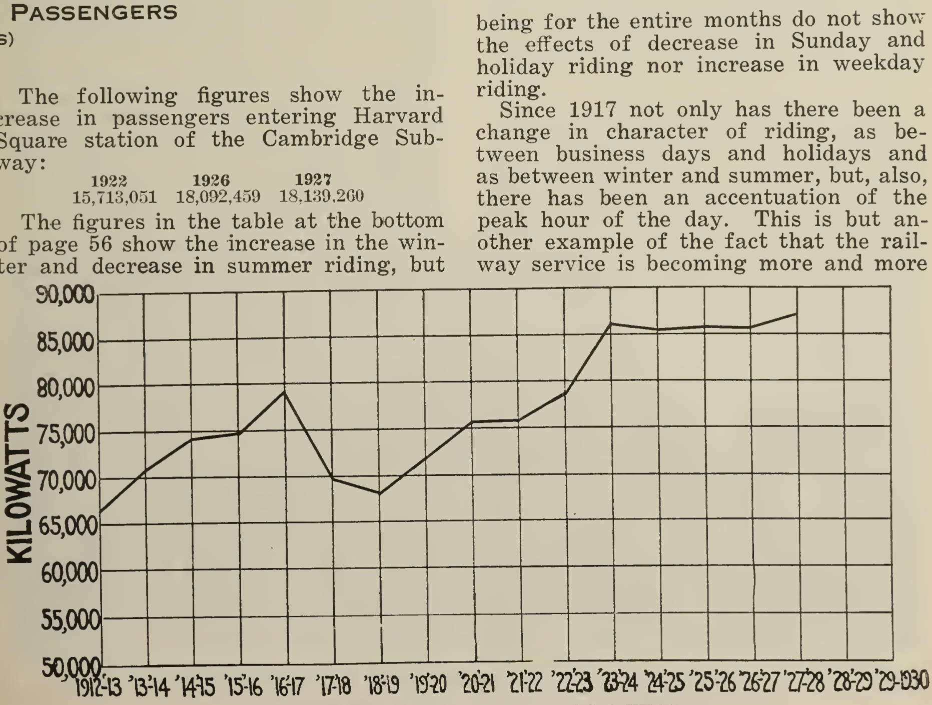
ED RAILWAY
'ENUE PASSENGERS
URDAYS)

The following figures show the increase in passengers entering Harvard Square station of the Cambridge Subway:

1922	1926	1927
15,713,051	18,092,459	18,139,260

The figures in the table at the bottom of page 56 show the increase in the winter and decrease in summer riding, but being for the entire months do not show the effects of decrease in Sunday and holiday riding nor increase in weekday riding.

Since 1917 not only has there been a change in character of riding, as between business days and holidays and as between winter and summer, but, also, there has been an accentuation of the peak hour of the day. This is but another example of the fact that the railway service is becoming more and more



MAXIMUM POWER USED IN EACH YEAR

a business service. Its main and primary function is taking people to work in the morning and home at night.

The following tables of growth from year to year of the maximum daily and hourly output of electric power demonstrates this:

Maximum D. C. K. W. H. Output for One Day

Year	Day	K. W H.
1915	Mar. 5	1.065.135
1916	Dec. 30	1.015,270
1917	Feb. 2	998.680
1918	Jan. 3	920.880
1919	Dec. 20	977,160
1920	Jan. 24	1.014,250
1921	Jan. 25	960.600
1922	Dec. 29	1,044.935
1923	Feb. 17	1.056.720
1924	Jan. 22	1,087.460
1925	Jan. 28	1.097.960
1926	Dec. 18	1.094.130
1927	Feb. 21	1.102,440
To 3-31 1928	Jan. 21	1,101,320

Maximum D. C. K. W. H. Output for One Hour

Day	Hour	K.W.H.
Jan. 29	5-6 P. M.	74.485
Dec. 29	5-6 P. M.	75.380
Feb. 12	5-6 P. M.	79.535
Feb. 21	5-6 P. M.	67,975
Dec. 13	5-6 P. M.	71.760
Jan. 14	5-6 P. M.	72.295
Jan. 18	5-6 P. M.	75.905
Dec. 13	5-6 P. M.	78.755
Dec. 18	5-6 P. M.	82.965
Jan 24	5-6 P. M.	86.245
Jan. 28	5-6 P. M.	85.660
Jan 29	5-6 P. M.	85.900
Jan. 29	5-6 P. M.	85.870
Mar. 9	5-6 P. M.	87.215

The accompanying graph of traffic swings, which is a revision of the one printed in the May, 1927, issue of "Co-operation" illustrates some of the above points, as does also the chart of maximum power loads, shown for the first time in "Co-operation."

Let us be wreckless men instead of reckless men.—*Commonwealther.*

The best safety device known is the careful man.—*Commonwealther.*

DERAILMENTS AND SPLIT SWITCHES

Derailments and split switches are a source of great annoyance to the public. When a car splits a switch or becomes derailed, if it is off the rail any distance or splits the switch and goes far enough for the trucks to bind, it means a serious delay to cars. It usually delays traffic in both directions, and if it is necessary to use jacks a half-hour or more of delay is the usual result. It may be much longer before a car can be replaced and traffic resumed, which is especially true of derailments in the subway.

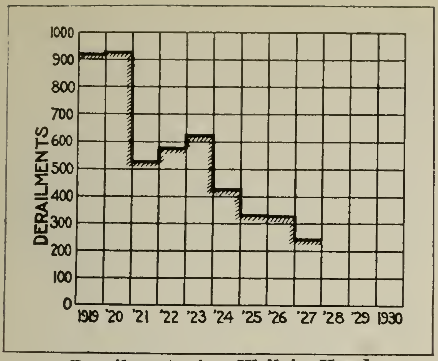
Delays caused by derailments or split switches cannot be charged to other agencies as can broken-down trucks, open drawbridges and fires. The Railway and its employees must take the full blame and censure of the public.

Great progress has been made in recent years on this property in decreasing accidents of this type and the consequent delays. Following is a list of the derailments and split switches reported during the last nine years: 1919, 920; 1920, 927; 1921, 524; 1922, 576; 1923, 622; 1924, 423; 1925, 329; 1926, 328; 1927, 243.

There are several reasons for this gratifying improvement, namely, greatly improved condition of track and special work; new and better car equipment and greater care in operation; fewer new men in service, and more careful inspection of tracks, switches and car equipment.

The maintenance department has contributed by installing better types of switches with spring locking throws at facing points, by carefully gaging and surfacing tracks not entirely rebuilt, by installing proper guards and elevating

INTERDEPARTMENTAL COMMITTEE ON DERAILMENTS
Left to right, Chas. A. Howard, rolling-stock and shops; Jos. McDonald, rolling-stock and shops; B. W. Ellis, maintenance; E. A. Kelley, transportation; John J. L. Manning, power.



Derailments Are Well in Hand

rails on curves and by constantly grinding and building up worn special work.

The department of power has introduced a uniform type of electric throw, with a heavy spring locking device to hold switch points in position.

The department of rolling-stock and shops has adopted standard wheels and greatly reduced the number of iron wheels in use upon which chipped flanges, a prolific cause of derailment, frequently occur.

The transportation department has caused all operators to be thoroughly instructed in regard to operation through special work and switches, and over streets where special care is necessary.

All derailments and split switches are now fully investigated by a committee consisting of one representative from each department. It is the duty of this committee to determine the cause, if possible, to report to all concerned and to take action necessary to prevent a recurrence in a particular place.

During 276 days from May 1, 1927, to Feb. 1, 1928, there occurred 277 cases of derailments and split switches. During that time our surface cars traveled 26,678,850 miles; or one case of derailment or split switch to 96,313 miles. This is nearly four times around the earth.

During this period the rapid-transit cars traveled 13,000,000 miles with only two derailments. This is one derailment for thirteen round trips to the moon.

When it is considered that the flange of a surface-car wheel, which holds the wheel to its path between the rails, is only three-quarters of an inch in depth, about the size of one's thumb, and there are 232 electric switches, 324 spring switches and many keyed switches through which our cars are constantly passing, the status of derailments outlined above is very favorable.

This enviable record has been brought about by the co-operation of all our forces. With a continuation of this co-operation, we can look forward to a still greater improvement.

FAREWELL TO THE WOODEN CAR

The last wooden car on the Rapid-Transit Lines was retired from service on March 27, 1928. The wooden cars, which have been retired, have now been practically all replaced by steel cars—ninety-eight out of the order of one hundred being in service. The remaining two are expected to be in service about May 1.

The Rapid-Transit Lines has also placed in service the entire lot of sixty new steel cars ordered for the Dorchester Rapid Transit Extension. Thus there will be in operation a total of 160 new steel rapid-transit cars involving an investment of $3,700,000.

THE ORATORS CONCLUDE

The 1927-28 class in public speaking, together with a few alumni of previous classes, held a dinner meeting at the Hotel Bellevue on April 16 with W. H. Burrell as toastmaster. During the evening opportunity was given for all members to demonstrate their proficiency in speaking on their feet and all agreed that this meeting was a fitting close to a most profitable course. The work of the instructor, E. A. Sullivan, was highly commended.

BOWLING LEAGUE SCORES

Boston Elevated

Final Standing

	Won	Lost	Pinfall
Rapid Transit Lines	85	19	37336
Rolling Stock and Shops	77	27	37205
Division One	66	38	36629
Repairmen	65	39	36492
Division Two	64	40	36613
Division Three	64	40	35804
Sullivan Square	54	50	35478
General Manager	54	50	34306
South Boston Power	50	54	35411
Division Four	44	60	34940
Automotive Equipment	36	68	34401
Everett Shops	25	79	33930
Receiving Department	25	79	33737
Supervisors	19	85	33491

High single string, Adams.............. 148
High three strings, Moulton.............. 365
High team three strings, Division Two.. 541
High team three strings, Repairmen..... 1519

Rapid Transit

Final Standing

	Won	Lost	Pinfall
Newman	81	31	38101
Power	79	33	38015
Thomas	73	39	37845
Sprague	61	51	38147
Perron	56	56	36610
Butler	40	72	36227
McCrystal	33	79	35988
Hirsch	25	87	35792

High team single for season, Newman.... 518
High team three for season, Thomas..... 1470
High individual string for season, Page.. 137
High three string for season, Shea....... 342

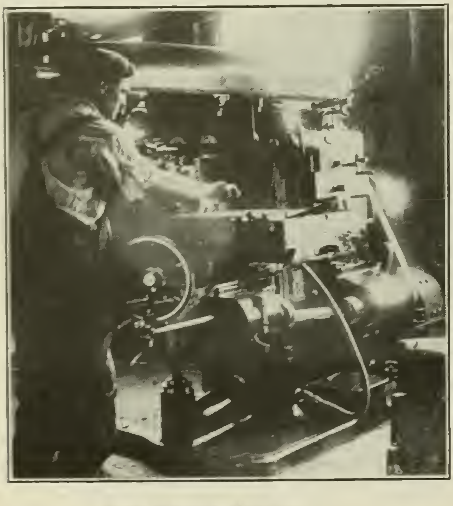
ELEVATED CLOSE-UPS

The Machinist

(See illustration on front cover)

THE front cover illustration this month shows a part of a new milling-machine, recently purchased for the machine shop, Albany street, with a portrait of its operator. A complete picture of the machine is reproduced below. This fine new machine is typical of the use of modern machinery which today is so necessary in any industry to enable it to meet competition. This new machine was put into service May 2, 1927, and the output of journal boxes which are surfaced on the machine was immediately increased more than 50 per cent. Before this machine was purchased there was a continual shortage of journal boxes due to the slow methods of surfacing, although there were three planers constantly on this work. Now there is an ample supply of boxes, with enough continuously on hand to satisfy immediately any reasonable demand. From May 2, 1927, to December 31, 1927 1,776 journal boxes were surfaced (or milled as it is termed when the surfacing is done on a milling machine). In addition fourteen large bronze sprockets for escalators and more than 400 axle collars were milled. It is expected that this machine will be put on other work where considerable savings can be made, after the journal-box situation has been fully cleared up. This machine is what is known as a No. 5-B Brown and Sharp milling-machine.

The new milling-machine is now part of the equipment described in an article by Rudolph Kundert in the issue of "Co-operation" for January, 1927, page 6. It would be well to review that article in order fully to understand the place occupied by the new machine. Space does not permit reprinting the article, but a few figures will be repeated. During 1925, 5,400 armature bearings, 5,700 axle bearings and 4,530 journal bearings were delivered from the shop to the Albany street storeroom. In 1925 this shop received 11,752 orders.



New Milling Machine

The work of the shop comprises mainly boring, turning, milling, drilling, grinding, and bench work, including filing and chipping. In addition there are operations calling for special or single-purpose machines. One such is a broaching machine, which was described in the article, used for broaching or machining the inside of a hole, such as that in a brush holder or the hub of a pulley or gear.

The article also stated that in 1925, 1,100 new and reclaimed journal boxes were put through the shop. These boxes are now made from steel. Before the advent of the new milling-machine they were planed on both sides in lots of ten on parallel bars, requiring thirteen hours for that operation. Then the tops and faces for the covers were planed in smaller lots on a special fixture arranged to hold them at the proper angle.

The purchase of a new machine is an indication of the determination of the management to keep the equipment strictly up to date.

SAFETY FIRST

Johnny Haultight, coxswain aboard the U. S. S. Arkansas, relays this:

Ole Olson, track walker, was testifying after a head-on collision.

"You say," thundered the attorney, "at 10 that night you were walking up toward Seven Mile Crossing and saw No. 8 coming down the track at 60 miles an hour?"

"Yah," said Ole.

"And when you looked behind you saw No. 5 coming up the track at 60 miles an hour?"

"Yah," said Ole.

"Well, what did you do then?"

"Aye got off track."

"Well, but then what did you do?"

"Well, aye said to self, 'Dis bane hell of a way to run a railroad.' "—Boston Daily Globe.

There are men who believe they are honest and yet practice a small element of dishonesty under the belief that it is shrewdness.—*The Houghton Line.*

CONTRACTS

(Concluded from page 55)

tially completed his part, he may recover the contract price, less appropriate deductions. Time of completion is not usually of the essence of the contract, unless it is made so in words. Unless the contract otherwise provides, no pay is due under a contract for work to be performed, until the work has been completed. If the defendant prevents the plaintiff from completing the work, the plaintiff can recover the fair value of the work done.

Breach of Contract

As a general rule, the failure of one party to perform any part of his promise is a breach of contract. If the breach goes to the essence of the contract, he cannot recover under it, the contract is discharged, and the injured party is excused from further performance, and has an immediate right of action. The general rule applies where the promises appear to be mutually dependent. Such a contract is called an entire contract. But if the contract provides specific pay for specific acts or goods, and the contract is otherwise readily severable, the contract is a severable contract, and a material breach of one item will not justify non-performance of the other items. The question whether a contract is entire or severable is usually one of implied intent. A contract, between a grain elevator and a railroad, to take all through grain at one cent a bushel, has been held entire, while a contract to deliver coal in 12 equal monthly instalments, at a stated price per ton, has been held to be severable.

Under the law of Massachusetts, if one of the parties makes performance of the contract impossible or repudiates the contract, before the time for performance arrives, the other party is not entitled to regard the contract as fully ended. He cannot recover until the other party fails to perform when performance is due.

A substantial breach at the threshold (in limine) of a contract, if it involves bad faith, will end the contract, even though the breach did not go to the essence of the contract. But any breach, or the performance of any part of the agreement, may be orally waived by the other party, without otherwise affecting the contract.

TRACK RECONSTRUCTION

(Concluded from Page 51)

no exact records available, it is the foreman's impression that when the track was built in 1909 a maximum of 400 men were used.

In 1909, of course, there were not available the modern track-building tools and machinery, or cars and trucks for handling the heavy material as there are today. All material for the former track on Highland avenue was handled on caravans with teams of four to six horses, and all heavy material, such as rails, necessarily had to be unloaded and placed in the track by hand.

SUPERINTENDENTS OF THE TRANSPORTATION DEPARTMENT

Standing, left to right, A. S. Scott, superintendent Div. 4; C. A. Bauch, superintendent Div. 1; J. H. Harrington, superintendent Div. 3. Sitting, left to right, H. A. Pasho, superintendent R. T. L.; James Smith, general superintendent; A. W. Senter, superintendent Div. 2.

EVERYDAY ECONOMICS—V

In this article Dean J. E. LeRossignol, Ph.D., L.L.D., of the College of Business Administration, University of Nebraska, discusses the topic of distribution, which is not only of personal interest to Boston Elevated Railway employees but should impart principles applicable in selling service. The dean's next topic will be transportation.*

Raw Materials and Finished Products

As we have seen, the primary industries produce raw materials, and the secondary industries—manufacturing, trade and transportation—get them ready for use by the final consumer.

A few of the products of the primary industries, such as berries and other fruits, may be eaten raw; but even these must be packed, shipped, stored, sold and delivered to the user before they can be said to be completely finished.

They may be finished, in so far as their shape or form is concerned; but until they are in the right place at the right time, the process of production is not complete.

Most other things have passed through long and complicated processes of production from the raw material to the finished product.

Wheat, after being cut, must be threshed, packed, sent to the elevator and the mill, ground into flour, packed and shipped again, baked into bread or cake, sold to the retail store, delivered to the customer, and, finally, served on the table—possibly, a year or more after it was growing in the field.

So, also, with wool, cotton, silk, fish, meat, lumber, iron ore, rubber, and all other raw materials. They must be manufactured, transported, bought and sold, insured, stored and delivered, and everybody who has had to do with them must be paid for his work.

So the final consumer often suspects that he has paid too much for the finished product, and the primary producer feels sure that he has received too little for the raw material.

For example, there may be less than 3 cents' worth of wheat in a 10-cent loaf of bread. This means that 3 cents goes to the farmer, and 7 cents to the railway, the miller, the baker, the merchant, and all the rest.

Again, there may be only 3 pounds of wool in a $50 suit of clothes, for which the wool-grower receives, say, $2, while the rest goes to manufacturers, merchants, and other secondary producers.

Or, there may be less than a dollar's worth of raw lumber in an oak chair costing $10; or less than 1 cent's worth of iron ore in a dozen safety razor blades selling for $1.

Or, to take a still more extreme case, a piece of real lace worth $1,000 may not have in it more than $5 worth of linen thread.

On the other hand, the cattle-feeder living near the market may receive as much as 50 per cent of the retail price of beef.

Evidently, then, there is no definite relation between the value of the finished product and the value of the raw material of which it is composed. And nobody can tell whether the primary producer is receiving too little or the merchant and manufacturer too much without considering the cost of all the processes through which the raw material goes, and all the services rendered by those who participate in production from first to last.

And yet, if any of the steps could be left out or shortened, the primary producer would receive more and the final consumers would pay less, and everybody would be helped by getting the possible cost.

Trade

The total population of the United States in the year 1920 was about 105,000,000, of whom about 42,000,000 were engaged in gainful occupations.

Of these, about 12,000,000 were engaged in agriculture and other primary industries; 12,800,000 in manufacturing and mechanical industries; 4,000,000 in trade; 3,000,000 in transportation; 3,500,000 in domestic and personal service; 2,000,000 in professional service; 800,000 in public service; and 3,000,000 in clerical occupations, of whom some were engaged in trade. The total number, then, engaged in trade may have been almost 5,000,000.

To be more specific, there were 1,328,000 retail dealers; 73,000 wholesale dealers; 1,125,000 salesmen and saleswomen; 413,000 clerks; 179,000 commercial travelers; 170,000 deliverymen; 161,000 bankers, brokers and money lenders; 149,000 real estate agents and officials; 134,000 insurance agents and officials; 125,000 laborers.

All of these are often called "middlemen," because they stand between the primary producers and the manufacturers, on the one hand, and the final consumers, on the other. And many people do not see just what service they render, nor why we could not do without them altogether.

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As a matter of fact, the number of "middlemen" is not so great as is commonly supposed, for it is barely 12 per cent of the total number engaged in gainful occupations.

Then, too, a great number of merchants are absolutely needed, for neither farmers nor manufacturers can conveniently reach the final consumers, nor can the consumers go to the farms and factories for what they need.

Farmers and other primary producers usually find that it pays them to give most of their time and energy to their principal occupation and to turn over their products to merchants who, as specialists in their own line, know how to sell to the best advantage.

Of course, there are cooperative selling associations which, like the California Fruit Growers Association, have saved to the farmer part of the merchants' profit. But such associations are not practicable everywhere, and, in any case, they must deal with merchants, more or less.

Manufacturers, also, have their selling departments, and often reach the final consumer through national advertising and traveling salesmen.

But there are limits to these methods also, and most manufacturers do most of their selling through wholesale and retail merchants, who are in closer touch with the consumers than they could possibly be.

Merchants render service to the consumers, too, in many ways: by studying their wants and needs; bringing goods of every kind from far and near; keeping and describing them; selling them in convenient quanties; delivering them as required, and extending credit.

Thus merchants render important services to primary producers, manufaceurers, and consumers and, instead of keeping them apart, they are bringing them closer together, by shortening routes and cutting down needless costs.

Merchants are not mere "middlemen," but producers, as much as any other class of business men, for they are a necessary part of the productive process, which is not complete until goods and services have been delivered and rendered to the final consumer.

SELLING

Goods do not sell themselves; hence the need of merchants and other selling agencies to carry on the process of exchange, without which our present industrial system could not exist.

In pioneer days, when everybody produced almost everything, there was little to exchange and, therefore, little need of merchants. Yet even then, the backwoodsman was glad to see an occasional peddler, who would buy his furs and potash and sell him firearms, powder and shot, tools, and cooking utensils.

Later, every village had its general store, where the farmers sold their grain and potatoes, butter and eggs, and bought various city products. And, as the merchants became more expert in the art of selling, country products moved more readily to the city market and city goods to the country market, to their mutual advantage.

Nowadays, when there is much division of labor, and both farmers and manufacturers produce for a nation-wide and, even, a world-wide market, the work of the merchant is more difficult than ever, requiring much knowledge and experience and many new methods, by which the process of exchange is facilitated and the wheels of industry kept moving.

Farmers in Minnesota, North Dakota and Manitoba no longer grow wheat for themselves, or for local markets, merely, but have, usually, a large surplus which they must sell, at home or abroad. Hence the need of grain dealers, cooperative marketing associations, produce exchanges, transportation facilities, and all the machinery which sells and delivers grain to the ends of the earth, pays the farmer, and enables him to continue his work of feeding the world.

A manufacturer of furniture in Grand Rapids does not produce to any extent for his family and friends, but for a large and distant market. Hence the need of an effective sales department, good advertising, and wholesale and retail dealers in many places, through whom the goods may be sold, payment received, and the manufacturer enabled to continue his business of making furniture for those who need it.

And if the various selling agencies of farmers, manufacturers and other business men were not speedy and effective in their work, goods would not move so quickly to market, the wheels of industry would slow down, production would fall off, and the national income would be greatly reduced.

In this connection, advertising has an important place, for it is one of the most effective means of selling goods and services.

The sellers need to know what the buyers want, and buyers what the sellers have. But, being far apart, they cannot come together except by means of traveling salesmen or by advertising.

Judicious advertising is an inexpensive selling agency, tends to increase the volume of business and to reduce prices, so that, as a rule, it is beneficial to both buyers and sellers.

CHANGES IN THE RESERVE FUND

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	$186,947.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	236,543.80*	Mar.	256,586.83†
Oct.	2,723.19†	April	181,694.29†
Nov.	29,302.22†	May	113,284.72†
Dec.	234.879.91†	June	92,917.54*

Profit and loss credit.........$137,259.76

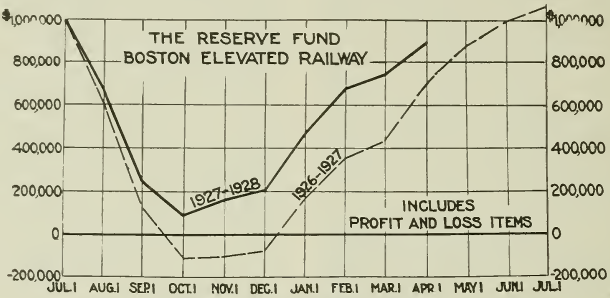
†Excess of revenue over cost of service.

Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*	Jan.	$191,381.71†
Aug.	408.570.65*	Feb.	75,469.39†
Sept.	147,204.65*	Mar.	159,985.97†
Oct.	79,421.56†		
Nov.	34,226.52†		
Dec.	280,536.75†		

*Excess of cost of service over revenue.



MARCH OPERATION

	1928	1927
GENERAL FINANCIAL DATA		
Revenue exceeded cost of service	$159,985.97	$256,586.83
Operating revenue per car-hour (A.E.R.A. std.)	$6.31	$6.28
Operating revenue per car-mile operated	62.04c	63.71c
Average fare per revenue passenger	9.249c	9.213c
Ratio operating expense to operating revenue	69.04%	67.37%
PASSENGERS CARRIED		
Revenue passengers	33,375,410	34,320,672
Per cent 5c, 6c and 6¼c passengers	19.23%	19.05%
Revenue passengers per car-mile operated	6.488	6.714
OPERATING FACTS		
Trips operated	651,998	656,758
Car-miles operated:		
Rapid-transit lines	1,486,117	1,363,956
Surface, two-man	1,795,827	1,925,146
Surface, one-man	1,354,165	1,330,443
Motor bus	507,862	492,165
Total miles operated	5,143,971	5,111,710
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.60*	1.60*
Accidents per 10,000 bus miles	1.83*	1.85*
Revenue passengers carried per accident	21,500	21,780
Average number of witnesses per accident	3.22	3.30
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	17	9
Employees complained of by car riders	106	147
Car defects reported per 10,000 car-miles	3.9	4.0
INFORMATION ABOUT POWER		
D. c. kw.-hr. output gross for month	26,906,095	24,441,980
Maximum kw. load	87,215	85,280
Tons of coal consumed for power	21,257	20,749
Lbs. of coal for power per d.c. kw.-hr. at cars	1.773	1.906
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	0.815c	0.861c
Per revenue car-mile	4.39c	4.22c
Kw.-hr. per revenue car-mile	5.387	4.900

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*Does not include miscellaneous accidents or derailments.

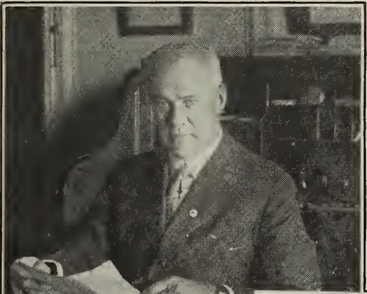
April 21, 1928 EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY CO-OPERATION

Volume 7 | MAY, 1928 | Number 5

BOSTON ELEVATED CLOSE-UPS

(See p. 76)

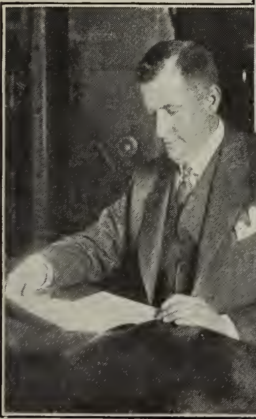


RUSSELL A. SEARS
General Claims Attorney

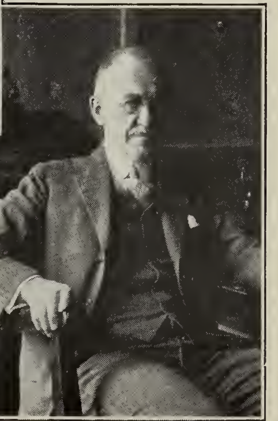
J. H. MORAN
General Auditor

H. WARE BARNUM
General Counsel

H. L. WILSON
Treasurer



EDWARD DANA
General Manager



To All 'El' Employees

ON this page for the past two months the message has dealt with the importance of salesmanship. This month it has to do with

SAFE OPERATION.

On page 58 of last month's issue were two aphorisms credited to the Commonwealth Steel Company, an organization in which safety is given a high place. These aphorisms were:

> ***The best safety device is the careful man.***
> ***Let us be wreckless men instead of reckless men.***

There is much of truth in these simple and cleverly worded statements. They stress the importance of the individual in accident prevention.

Every feasible device for promoting ought to be used in transportation as in the steel business. But these are of avail only as tools for the safe man.

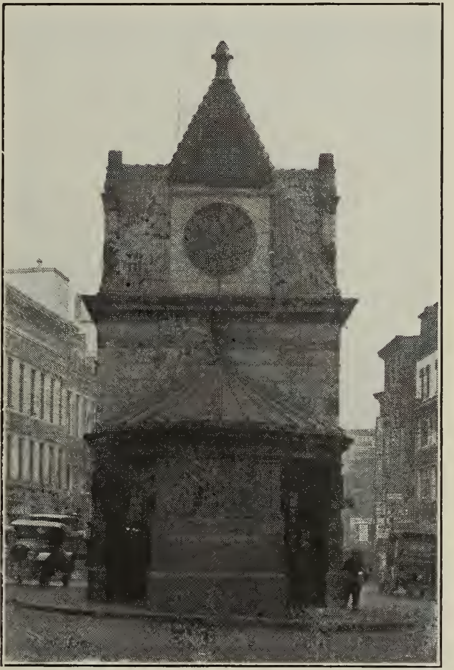
It may be that the careful man may not always be the wreckless man, but he is many times more likely to be wreckless if he is not reckless.

Edward Dana

NEW HEADHOUSES AT SCOLLAY AND HARVARD SQUARES

Increasing Traffic Congestion Has Brought About Elimination of Familiar Structures at These Busy Centers—Contrast is Particularly Noticeable at Scollay Square

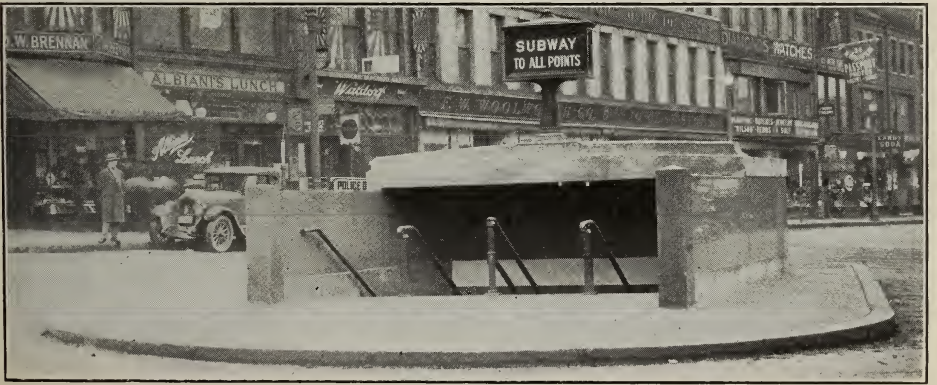
THE large and imposing structures which were formerly located at Scollay and Harvard Squares have been removed within the past few months and smaller structures erected in their places. This was done primarily in the interest of safety. The "Before and after" pictures shown this month tell the whole story. These pictures were taken, as nearly as possible, from the same points so as to show the contrasts more clearly. While some may regret to see the familiar and well-designed examples of architecture removed, in view of the present congested conditions in the streets surrounding these structures their replacement was logical.



PROBLEMS AT SCOLLAY SQUARE

The improvement at Scollay Square can be considered as part of the Cambridge and Court Streets widening development. The original plans contemplated the removal of the ascending escalator opposite Brattle Street and reversing its position so that the new exit would come out at the rear of the then existing structure in Scollay Square opposite Pemberton Square, and the removal of the then existing entrance and exit building.

It was finally agreed that the



"Before and After" Views at Scollay Square changes in the escalator exit structure were not necessary, but that a low entrance and exit structure should replace the existing high building. The new structure was to consist of a simple concrete covering of part of the stairway, with rolling doors at the center landing to permit the station to be closed. This plan has since been carried out.

The island on which the previous structure was located was also reduced in size so that less obstruction to street traffic is offered. The structure is so low that the traffic in all parts of the square is in plain view. The congestion with the old structure was serious, and in stormy weather it was difficult for patrons to get into and out of the station. The condition would have been worse when the street improvements are completed. The type of partly open structure has been used in a number of places in Boston.

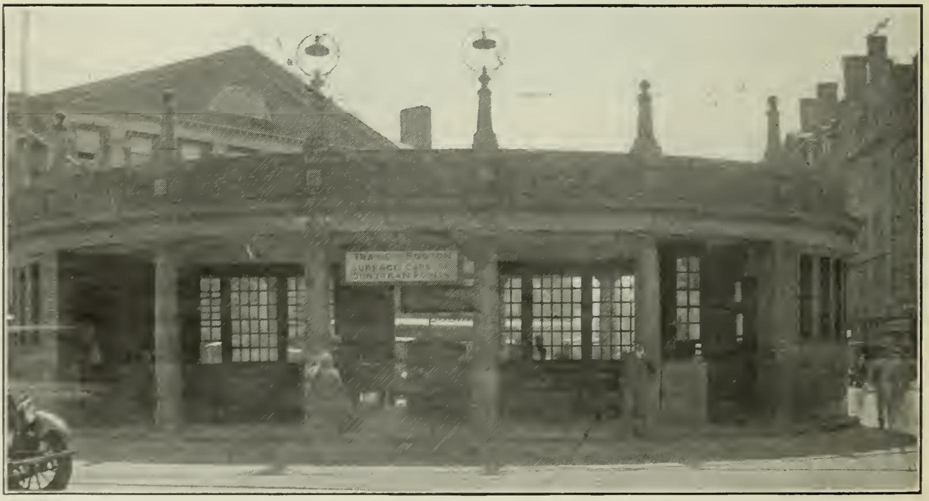
The open steps presented a winter and wet-weather drainage problem, which was met by providing numerous small holes in steps and platform to permit water to drip through into pans and thence into the drainage system.

Another problem in connection with this change was to provide temporarily, during the construction period, for the vast number of people who enter or leave the station during the twenty-four hours when it is in operation. This was done by the use of the exit at the Hanover Street end of the station as entrance and exit when necessary.

The Problem at Harvard Square

The headhouse forming a part of the Harvard Square Station was, like the Scollay Square headhouse, an excellent piece of architecture of its type, and in the days before the automobile was not objectionable from the standpoint of interference with traffic.

The increase in the use of the automobile, combined with the active business development around Harvard Square, changed the situation. The Harvard Square Business Men's Association and others, during the past few years, agitated the question of reducing the size of the headhouse and consideration was given to its possible removal. However, if the headhouse was removed, entrance and exits at the sidewalks would be required and these were found to be impracticable for structural



Headhouse at Harvard Square, as It Was

reasons, if no others. In addition, it is necessary to have a safety island in the Square for the protection of pedestrians crossing the large area. With the safety island as a necessity it was logical to retain the headhouse.

After numerous studies of the problem, covering several years, the necessary legislation was secured, and the Department of Public Utilities was designated to have supervision over the work.

The new structure is roofed with wood, covered with lead-covered copper. The walls around the escalator are built with brick facing corresponding to the finish of the fence surrounding Harvard Yard. The roof supports are also enclosed in brick. The inside finish of the stairways and the passageways between the stairways is of polished granite as before.

The stairways are protected with sash on three sides, the sash to be erected on the top of the stairways to provide a clear view through the station.

The result is a substantial reduction in interference with vision and the appearance of the structure is satisfactory.

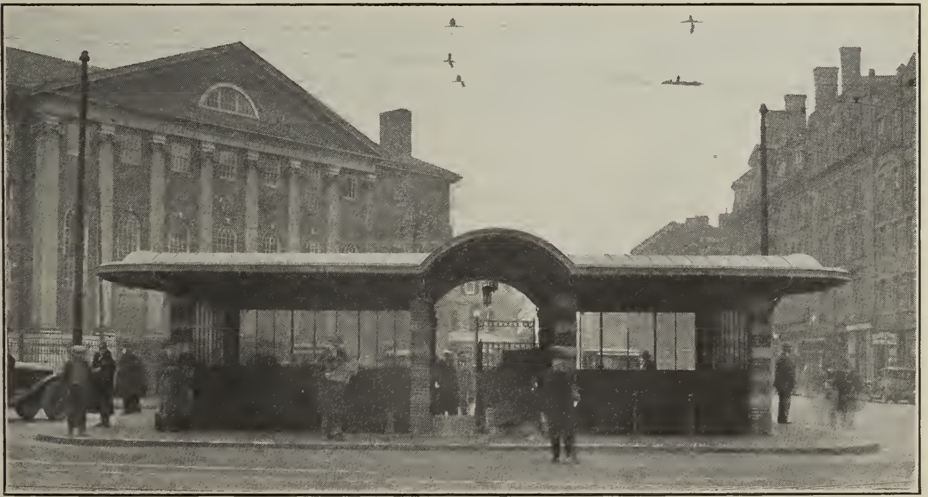
THE R. T. L. INSPECTOR

When riding upon Rapid Transit Lines trains you have probably heard a blast or two of the train whistle just as the train was entering an elevated or subway station. This is the signal of the motorman to the nearest inspector that he is needed by the train crew. It may be that the equipment has become defective, that an accident report is to be turned in or that a signal is out of order. In the R. T. L. division there are thirty-five inspectors trained to perform the duties of the several classes of employees.

When a man seeks promotion to an inspectorship he applies to the superintendent. His application with others is examined and if he is considered to have the qualifications he is expected to pass a written examination covering his knowledge of the Railway and its functions, of the locations of public buildings, parks, etc., of the proper routes for reaching various points on the system, of the operating rules, and of the train equipment, both control and air-brake.

Those who pass the examination are given instruction in the shop

(Please turn to Page 76)



Headhouse at Harvard Square, as It is

THE LAW OF NEGOTIABLE INSTRUMENTS*

This Lecture Deals with the Four Kinds of Negotiable Instruments: Promissory Notes, Bills of Exchange, Checks and Corporate Bonds. The Nature, Purpose and Essentials of Each Are Explained

By CHARLES B. GLEASON, Esq.
Attorney, Boston Elevated Railway

DEFINITIONS

A PROMISSORY note is a written, unconditional promise, by a person called the maker, to pay to a person called the payee or order, or to bearer, a fixed sum of money at a specified time.

A bill of exchange is a written, unconditional order, signed by the maker, addressed to another person called the drawee, requiring him to pay to the payee or order, or to bearer, a fixed sum of money at a specified time. Bills used in internal commerce within the United States, are commonly called drafts.

A check is a written unconditional order, payable on demand, drawn on a bank or banking house, against an apparent deposit of funds.

A corporate bond is a corporate promissory note, under seal.

The maker, payee or drawee, may be singular or plural.

PURPOSE

The purpose of negotiable instruments is to facilitate business transactions, by creating obligations which are good against certain defences which would otherwise be valid. Under the general law of contracts, when a claim is assigned, it is held by the assignee subject to all the defences and grounds for relief which might be raised against the assignor, such as lack of intention to form a contract, lack or failure of consideration, lack of mutuality, illegal purpose, fraudulent misrepresentation, mutual mistake, or breach of contract. When a bill or note is transferred to a third party, if the transferee holds without notice of any defect, and in due course of business, the bill or note is good against such defenses and grounds for relief. This is a desirable result. For example, a shipper of goods in Boston may make a bill of exchange on a drawee in New Orleans, attach to it a bill of lading, and take it to a bank and sell it, and get his money. This is called negotiating it, and the bill is called a negotiable instrument. The special law relating to negotiable instruments makes this procedure feasible, for each person or banking house, which takes the bill by endorsement, gets a good merchantable title, secured by the goods as collateral.

ESSENTIALS

For a bill or note to be a negotiable instrument, there are six essentials: (1) It must be a promise or order in writing; (2) it must be signed by the maker or a person duly authorized; (3) it must require payment to a specified person or order, or to bearer; (4) it must provide for the payment of a specified sum of money; (5) it must be payable at a specified time or at a time which must certainly arrive; (6) the promise (or order) must be unconditional.

WRITING AND SIGNATURES

It is a written instrument within the rule, if it is written with ink or pencil. The signature may be a mark, trade name, or fictitious name. It may be made by an agent with oral authority.

If an incomplete bill or note is delivered, the person in possession has a prima facie authority, within a reasonable time, to fill in the blanks necessary to make it a complete instrument. But if an incomplete instrument is stolen before delivery, or if the signature is forged, it cannot be made a valid instrument, except by act of the ostensible maker. A minor or insane person under guardianship cannot make a valid bill or note, except as authorized by the Court. But a minor may transfer title though he cannot be held liable as an endorser. A bill or note is not invalid, if it lacks a date, or fails to specify where it is drawn or payable, or if it is ante-dated or post-dated, unless that is done for fraud. It need not specify a consideration.

THE PAYEE

The bill or note may be made payable to the payee or order, or to the order of the payee, or to bearer. The word "order" or "bearer," or equivalent words must be used. A wrongly-described payee is sufficient, if the person intended can be ascertained.

THE SPECIFIED SUM

The sum of money is sufficiently specified, although it is to be paid:—(1) with interest; (2) by stated installments; (3) with a provision that, upon failure to pay any installment, the whole shall then become due; (4) with exchange at a fixed or discount rate; (5) with costs of collection or an attorney's fee; (6) if the specified sum, though not stated, can be computed from facts stated in the instrument, without resort to extrinsic evidence.

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*Abstract of the seventh lecture in the course in Everyday Law. F. W. Casey and E. M. Brooks, committee in charge, delivered at Franklin Union and Sullivan Square, Monday, Feb. 6, 1928.

THE TIME OF PAYMENT

The time of payment is sufficiently specified, if the note or bill is payable on demand, or at sight, or at a fixed period thereafter, or if it is payable at a fixed period after the occurrence of an event which must certainly happen, such as the death of the maker. But if it be payable at a fixed period after the occurrence of an event not certain to happen, such as the marriage of the maker, it is not a negotiable instrument, though it may be a good common law contract. Bills or notes payable on demand must be presented within a reasonable time, or indorsers and others secondarily liable will be discharged.

Every bill or note is payable at the time fixed, without three days of grace, unless grace is specified. If the day of maturity falls on Sunday, or a holiday, the bill or note is payable on the next succeeding business day. If payable on Saturday, it should be presented on the next succeeding business day, except that bills payable on demand or on Saturday may, at the option of the holder, be presented for payment before 12 o'clock noon on Saturday, when that entire day is not a holiday.

THE UNCONDITIONAL PROMISE

The promise is considered unconditional, although the note or bill indicates a particular fund out of which it is to be paid, if payment is not restricted to that fund. The note or bill may contain additional provisions authorizing the sale of collateral in case it is not paid, or other provisions for security, in addition to the unconditional promise.

ACCEPTANCE OF BILLS

The holder of a bill in due course or his agent may present it to the drawee before maturity, for acceptance. That is, a holder of a bill by endorsement, may take it to the drawee, and ask him to accept it. If the latter agrees, he should write "Accepted" on the face of the bill, and sign his name. It it is not accepted, it may be regarded as dishonored, and immediate steps for collection taken against prior endorsers and the maker. If the drawee writes upon the bill "accepted," and signs his name it thereupon becomes the primary obligation of the drawee, and the drawer is then only secondarily liable. It is not necessary to present a bill for acceptance, except where such action is obviously necessary to fix the time of payment, as where a bill is drawn ten days after sight, or where it expressly requires acceptance, or where it is payable elsewhere than at the residence or place of business of the drawee.

PRESENTATION FOR PAYMENT

If a bill or note is not presented for payment at maturity, the persons secondarily liable are discharged from liability, but persons primarily liable are not discharged and may be held liable for its payment, subsequently. The persons secondarily liable are the endorsers; also the maker of a bill after it has been accepted. A bill must be presented at the place specified, or if no place is specified, then at the place of business or residence of the person liable, or wherever he can be found, or at his last known place of business or residence. It must be surrendered upon payment. If the maker or accepter is dead, it must be presented to his personal representatives (i.e., executors or administrators), if they can be found. It must be presented to all joint and several promissors. Delay in presentment is excused, if caused by the sudden serious illness of the person whose duty it is to act, or other cause really making presentment at the due date impossible. If payment is refused, notice of the refusal (called dishonor), must be given to prior parties (i.e., endorsers and maker) or they will be discharged. If the parties reside in the same place notice must be given before the close of business hours on the following day, or at the place of residence before 9. If sent by mail it should be mailed in time to reach the notified party in the usual course on the following day. If the parties reside in different places, the notice may be deposited in time to go by mail in the usual course on the day following dishonor. If the bill or note is a "foreign" bill or note, that is made in one state or country to be paid in another, presentment and technical protest must be made by a notary, after payment has been refused, or persons secondarily liable will be discharged.

CONSIDERATION

Lack of consideration is a defence between maker and payee and others having notice. So if a note is a mere gift, the payee and any subsequent holder who knows the facts, cannot enforce it. But lack of consideration is no defence to one who signs for the accommodation (i.e., lends his name and credit) of another party.

ENDORSEMENT

The endorsement must be written on the bill or note or a paper attached to it. The endorsement may be "in blank," that is "to bearer"; qualified, that is "without recourse"; special, that is to a specified person or order; or restrictive, that is "for collection only." If the bill or note is payable to two or more persons all must endorse, unless one has authority to act for the others.

Holder in Due Course

One is holder in due course, if he has taken a bill or note regular on its face, before maturity, without notice of previous dishonor, in good faith, for value, and without notice of any defect in the title of his transferer.

Warranties

Every person, negotiating a bill or note, impliedly warrants that it is genuine and what it purports to be, that he has good title to it, that all prior parties had capacity to contract, and that he has no notice of any fact which impairs its validity. But when the transfer is by delivery only, the warranty extends to the immediate transferee only. Endorsers impliedly warrant that the instrument will be paid, and if dishonored and notice of dishonor is duly given, that they will pay the amount to any subsequent holder or endorsee in due course. The warranty that prior parties had power to contract does not apply to persons negotiating public or corporate bonds.

Checks

A check is like a bill of exchange, but does not need to be presented for acceptance, and the death of the drawer revokes the authority of the bank to pay it, although the maker of the check remains liable on it. Delay in presenting releases the maker, if he sustains injury by the delay. A check is overdue after a reasonable time for presentation has elapsed, ordinarily 24 hours after its receipt. Upon certification of a check, at the request of the payee, the bank makes a special account for its payment and charges the maker's account with the amount, and the maker's liability ceases; if certified at the request of the maker, he remains secondarily liable on the check. Obviously a check should be deposited for collection immediately, unless the holder is willing to assume the risk of the bank failing.

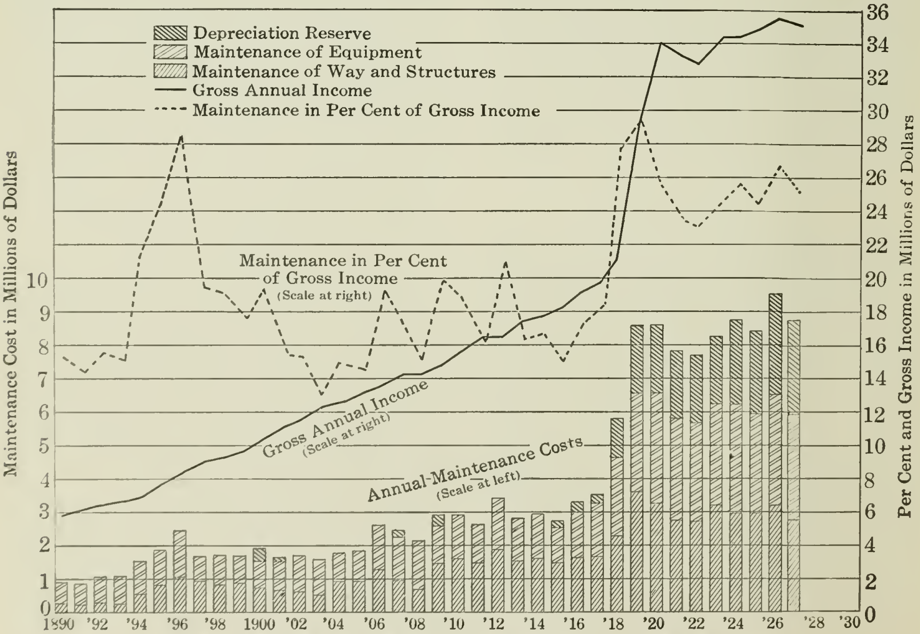
Stock Certificates

By Gen. Laws c. 155, the law regarding bills and notes is in practical effect applied to stock certificates endorsed in blank or to a specific person, or if the transfer is effected under a power of attorney or assignment not written upon the certificate. Title to the stock passes upon its delivery, but substantially all persons not having notice of the transfer are protected, if they might be misled or prejudiced.

WHAT IT COSTS TO MAINTAIN THE "EL"

For the calendar year, 1927, the expenditures for maintenance renewals and depreciation account were as follows:

Maintenance of way and structures	$2,765,686



INCOME AND MAINTENANCE EXPENSE OF THE RAILWAY

Maintenance of equipment (including power equip.)	3,187,507
Depreciation reserve	2,824,220
Total	$8,777,413

This total is 24.9 per cent of the total gross income for the year, which was $35,193,410.

The chart printed in the June issue of "Co-operation" showing the details of this account back to and including 1890 has been brought up to date and is shown again in this issue.

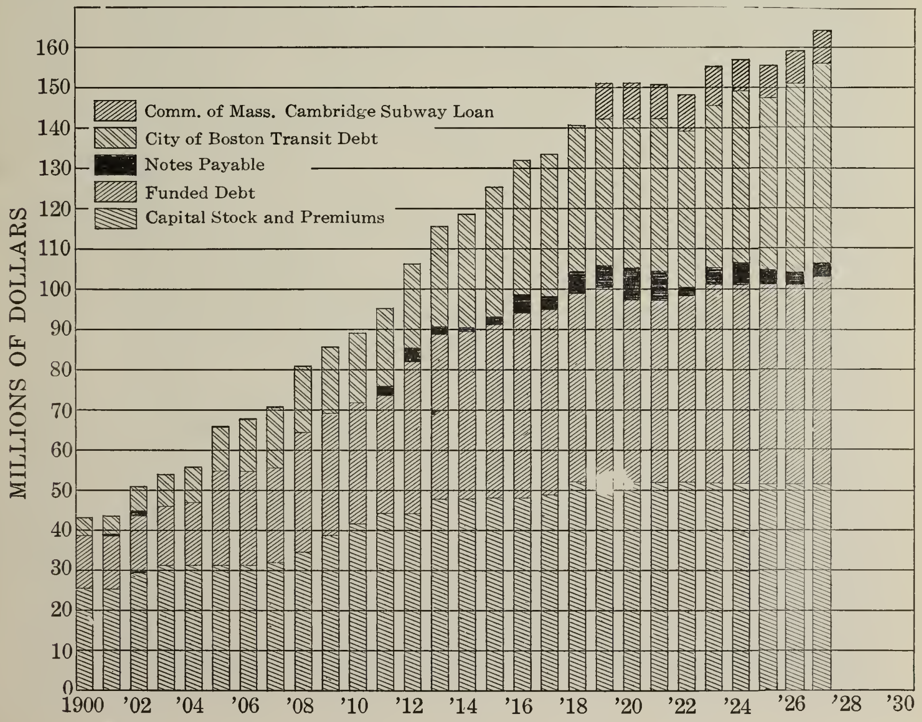
SOURCES OF BOSTON ELEVATED CAPITAL

The accompanying chart shows the details of the gross transit debt of the Railway. The debt is made up of five parts, and five parts only. First come the capital stock and premiums, which are what might be called the stake of the owners of the property in it. Then there is the funded debt or mortgage on the property. These two items are now almost exactly equal. Next comes the current indebtedness or notes payable, a comparatively small and fluctuating item. After this is the investment of the City of Boston, largely in subways, which now almost equals either of the other two large items. Finally, there is the investment of the Commonwealth in the Cambridge subway. The chart has been revised from the one shown in the June, 1927, issue of "Co-operation," where there is a complete table of the same data as are shown in the chart. To bring this table up to date it may be noted that the following are the items as of the close of the fiscal year 1927 (June 30, 1927):

Capital stock and premiums	$ 51,768,755
Funded debt	51,674,000
Notes payable	2,800,000
City of Boston transit debt	50,293,700
Commonwealth of Massachusetts, Cambridge subway loan	7,648,000
Gross transit debt	$164,184,455

NEW ELECTRIC-DRIVE BUSES

The Railway has recently placed an order for twenty-eight additional buses equipped with gas-electric drive. These will be built by three different companies, the Twin Coach Company of Kent, Ohio; The American Car and Foundry Motors Company of New York and the Versare Corporation of Albany, New York. Some of the buses will have two generators supplying power to two driving motors, while others will have one generator supplying power to two driving motors.



THE CAPITAL INVESTMENT IN THE BOSTON ELEVATED RAILWAY

GROUP IN ATTENDANCE AT CLOSING EXERCISES OF 1927-28 EDUCATIONAL PROGRAM
These exercises were held at the Instruction School, Sullivan Square on Thursday, May 3, 1928, General Manager Edward Dana, presiding.

DR. SMITH SPEAKS AT CLOSING EXERCISES

The exercises closing the sixth season of the educational program of the Boston Elevated Railway were held at the instruction school on Thursday evening, May 3, with the general manager, Edward Dana, presiding.

The principal address was delivered by Dr. Payson Smith, commissioner of education, Commonwealth of Massachusetts, who spoke on the subject of education. He used as the basis of his remarks a summary of the results desired from education which had been prepared by a large conference of industrial and educational leaders. An abstract of this will appear in a later issue. For the present purpose it may be said that the benefits of true education are to be found more in the ability of the individual to meet the demands of society than merely to acquire knowledge. Honesty, sincerity, ability to shoulder responsibility, thrift, skill in expression, and qualities of this nature were stressed and illustrated by the speaker.

Following this address the chairman called on members of the public-speaking class for brief statements of what the educational program of the Railway is doing for employees. Responses were made by J. A. Griffin, supervisor Division 4; C. H. Dey, assistant engineer department of power and E. A. Kelley, assistant to the superintendent of transportation. These men spoke enthusiastically of the teamwork, better salesmanship, greater efficiency in the performance of duty and broader outlook which have resulted from participation in the courses. The foreman conferences were given credit for an influence spreading far beyond the ranks of those who attended them.

After the taking of the photograph reproduced opposite, a motion picture, "Love Me, Love My Dog," one of the "Our Gang" comedies, was shown, following which certificates were distributed as follows:

Foreman conferences:	
1st year—Combined	43
2nd year—Non-transportation	14
2nd year—Transportation	21
3rd year—Combined	39
Public speaking	11
Fabric painting	27
Psychology	17
Everyday law	85
Group conferences:	
Maintenance department	65
R. S. & S. department	32
Transportation department	87
Automotive maintenance	44
Supervisors association	186
	671

During the evening music was furnished by Edward J. Fitzgerald, leader, and orchestra, and at the close a collation was served in the rear of the room.

A questionnaire was distributed with the programs requesting suggestions as to courses which might prove acceptable next year and also general comment on the educational program. It is hoped that these will be filled in promptly.

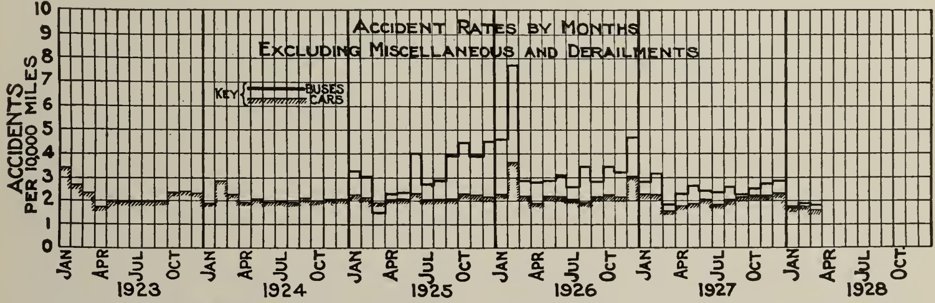
The closing exercises were attended by nearly four hundred men and women.

C. M. T. C.

The officers of the Citizens' Military Training Camps are being flooded with applications for places for the coming summer. Last year there were 39,000 men in the camps and 30,000 more were denied admission for lack of facilities. Inquiries regarding the July and August camps of this year may be addressed to Lt. Col. G. V. Height, chief recruiting publicity bureau, United States Army, Governors Island, N. Y.

ACCIDENT SITUATION IMPROVING

As shown by the accompanying chart which is a revision of the one appearing in the March issue of "Co-operation" the accident rates for the first three months of the current year were highly creditable. The rates for buses and cars are now substantially alike. The April figures, which appear on page 80 of this issue, show that there were 1.59 car accidents per 10,000 car-miles, as compared with 1.79 last April, and 1.98 bus accidents per 10,000 bus-miles as compared with 2.38 last April. This is an improvement of 11.2 per cent in the car accident rate and 16.8 per cent in the bus accident rate.



FIRST THREE MONTHS OF 1928 SHOW PROGRESS IN ACCIDENT REDUCTION

ELEVATED CLOSE-UPS

The Executive Officers

(See illustrations on front cover)

THE subjects of the close-ups this month are the five executives of the Railway, the officials who report directly to the trustees.

Henry L. Wilson, treasurer, the senior of these officials, as measured by length of service, has recently rounded out 40 years of service with the Railway.

Mr. Wilson joined the staff of the Railway as chief clerk of revenue accounts on April 25, 1888. At that time the president was Henry M. Whitney, and the general auditor under whom Mr. Wilson worked was Charles S. Sergeant. Mr. Wilson had previously spent six months as a clerk with the Metropolitan Street Railway, at Kansas City, having gone there from Boston, where he was born and educated. Before going to Kansas City he had been bookkeeper in a Boston importing house. Mr. Sergeant soon secured promotion of his young clerk to the chief clerkship in the auditor's office and soon thereafter, on December 26, 1892, he became auditor. After 16 years in this position he was appointed treasurer on October 5, 1908.

Mr. Wilson was a founder and the first president of the Street Railway Accountants' Association, formed in 1897. At the time this was the most active association in the electric railway field and it immediately took up the subject of standardizing the accounting system for electric railways. As president, Mr. Wilson could not serve on the committee on standard classification of accounts appointed at the first meeting, but he became a member on retirement from the presidency and has been continuously a member ever since. He is still active in this field and has been called into consultation within the last few weeks in connection with the revision of the classification now under consideration.

The other executives shown in the close-up, in order of seniority as measured by length of service are Russell A. Sears, general claims attorney, with twenty-six years of service; Edward Dana, general manager, with twenty-one years of service; John H. Moran, general auditor, with nineteen years of service, and H. Ware Barnum, general counsel, with nine years of service.

The total service of the five executives is 115 years, an average of twenty-three years per executive.

SUPERVISORS CLOSE SEASON

The last meeting of the season of the Boston Elevated Railway Supervisors' Association was held at the Instruction School on May 16 with a large attendance. The principal speaker was Charles Gordon, editor of the *Electric Railway Journal*, New York, whose topic was "Our Business of Transportation." He presented an analysis showing how the business has survived in spite of enormous obstacles because transportation is a vital necessity. It is a romantic business in view of the fact that it is in such close touch with the everyday needs of the people.

As this was the annual meeting, the election of officers was held, with the following result:

President—John P. Banks, transportation.

Vice-president—Thomas Kivell, maintenance.

Vice-president—J. A. Smillie, R. S. & S.

Vice-president—E. L. Doyle, power.

Secretary-treasurer—J. L. Troy (re-elected).

The new president will select four other members of the board of control in due course.

The report of the auditing committee showed receipts of $420.50 and expenditures of $192.70, leaving a balance of $227.80.

A resolution was passed thanking the management for the use of the Instruction Schoolroom and for general cooperation.

The board of control distributed cigars and cigarettes during the meeting, and it was closed by an excellent vaudeville entertainment.

THE R. T. L. INSPECTOR

(Concluded from Page 69)

pits and yards, which brings them into closer contact with the details of the equipment. In the yards they are instructed in the use of wire jumpers, the best methods for removing grounded contact shoes, springs, motor leads and brushes, and other details. The importance of safety is stressed, both in minimizing accidents to passengers and in being careful themselves when working on and around trains. The third rail is given special attention, with a view to preventing flashes or grounds which might cause injury to passengers or employees.

After this course of instruction the applicants are given a finishing touch by the superintendent, and they are then ready for the performance of their duties. They are then supplied with the necessary equipment, such as skeleton handles, tools, fuses, keys, etc., and are assigned to stations to learn the duties of the inspector by actual experience. It is then up to them to become 100 per cent inspectors and representatives of the Railway.

SUMMARY BY CAUSES OF 20-MINUTE OR LONGER DELAYS

The following table supplements the illustrated article which appeared on page 15 of the January, 1928, issue. For convenience the table has been rearranged in two sections, one showing the delays for which the Railway was responsible, the other the delays for which it was not responsible. The former increased nearly 11 per cent, while the latter increased less than 3 per cent.

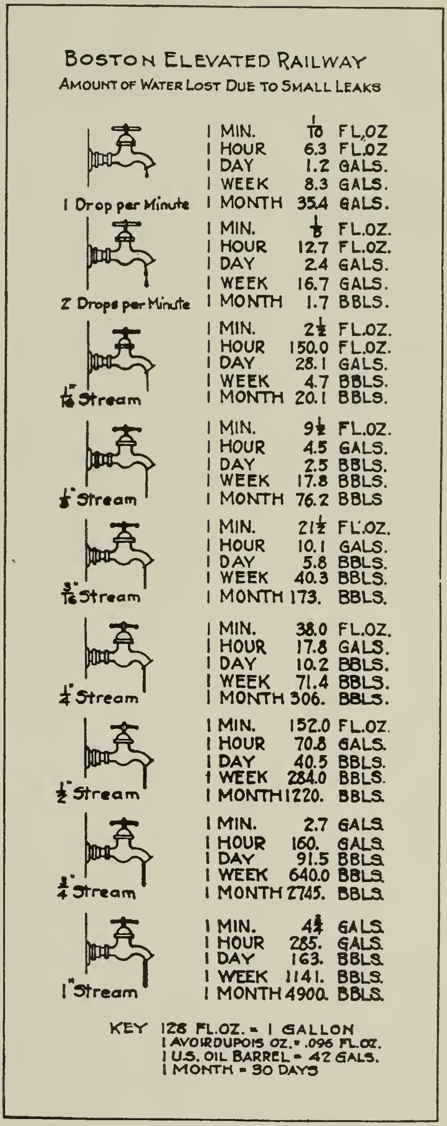
	Comparison of totals for first 4 months 1928	1927
Delays for which the Railway is not responsible:		
Broken-down vehicles, obstrucstructions	44	46
Fires	54	47
Parades or traffic, general delay	11	4
Drawbridges	3	4
Total	112	101
Delays for which the Railway is responsible:		
Derailments	23	25
Collisions	20	25
Wire breaks (power failure)	14	11
Defective cars or equipment	33	38
Fatal accidents	2	2
Loss of schedule trips	6	2
Total	98	103
Grand total	210	204

DON'T NEGLECT MINOR INJURIES

The importance of prompt treatment for minor injuries is emphasized by a recent case of an employee of our company where infection resulted from a minor injury which was not attended to until several days later. After the wound had become septic a doctor was called for the first time and the employee was taken to a hospital. Medical science was unable to save him and he died five days after entering the hospital.

This grievous situation is deeply regretted by the company and his fellow employees.

The company maintains first-aid kits over the system and three first-aid rooms where registered nurses are employed and every employee is earnestly urged by the general manager to make use of these facilities.



BOSTON ELEVATED RAILWAY

AMOUNT OF WATER LOST DUE TO SMALL LEAKS

1 Drop per Minute	1 MIN.	1/10	FL.OZ
	1 HOUR	6.3	FL.OZ
	1 DAY	1.2	GALS.
	1 WEEK	8.3	GALS.
	1 MONTH	35.4	GALS.
2 Drops per Minute	1 MIN.	1/5	FL.OZ.
	1 HOUR	12.7	FL.OZ.
	1 DAY	2.4	GALS.
	1 WEEK	16.7	GALS.
	1 MONTH	1.7	BBLS.
1/16" Stream	1 MIN.	2½	FL.OZ.
	1 HOUR	150.0	FL.OZ.
	1 DAY	28.1	GALS.
	1 WEEK	4.7	BBLS.
	1 MONTH	20.1	BBLS.
1/8" Stream	1 MIN.	9½	FL.OZ.
	1 HOUR	4.5	GALS.
	1 DAY	2.5	BBLS.
	1 WEEK	17.8	BBLS.
	1 MONTH	76.2	BBLS
3/16" Stream	1 MIN.	21½	FL.OZ.
	1 HOUR	10.1	GALS.
	1 DAY	5.8	BBLS.
	1 WEEK	40.3	BBLS.
	1 MONTH	173.	BBLS.
1/4" Stream	1 MIN.	38.0	FL.OZ.
	1 HOUR	17.8	GALS.
	1 DAY	10.2	BBLS.
	1 WEEK	71.4	BBLS.
	1 MONTH	306.	BBLS.
1/2" Stream	1 MIN.	152.0	FL.OZ.
	1 HOUR	70.8	GALS.
	1 DAY	40.5	BBLS.
	1 WEEK	284.0	BBLS.
	1 MONTH	1220.	BBLS.
3/4" Stream	1 MIN.	2.7	GALS.
	1 HOUR	160.	GALS.
	1 DAY	91.5	BBLS.
	1 WEEK	640.0	BBLS.
	1 MONTH	2745.	BBLS.
1" Stream	1 MIN.	4¾	GALS.
	1 HOUR	285.	GALS.
	1 DAY	163.	BBLS.
	1 WEEK	1141.	BBLS.
	1 MONTH	4900.	BBLS.

KEY 128 FL.OZ. = 1 GALLON
1 AVOIRDUPOIS OZ. = .096 FL.OZ.
1 U.S. OIL BARREL = 42 GALS.
1 MONTH = 30 DAYS

SAVING AT THE SPIGOT

The department of maintenance has prepared the accompanying chart showing graphically the magnitude of the losses due to leaky faucets. These figures are based on actual tests so that their accuracy need not be questioned.

EVERYDAY ECONOMICS—VI

In this installment of the series of articles, Dean J. E. LeRossignol, Ph.D., L.L.D., of the College of Business Administration, University of Nebraska, touches upon our own field. He also treats of one of the most fundamental economic laws of business.*

TRANSPORTATION

An industrial map of the United States, or of any other country, will show, at a glance, that certain industries flourish in certain parts of the country and others in other parts. In other words, there is territorial or regional specialization of industry, so that all the regions, with their various resources, are dependent on trade and transportation for the exchange of their surplus products.

New England has her fishing, mixed farming, and manufactures, but neither coal, petroleum, cotton, nor citrus fruits, nor enough of wheat, wool, tobacco, or sugar to supply her needs.

Nebraska has a great surplus of corn, wheat, beef, and pork, but lacks coal, iron, petroleum, lumber, cotton, and many other things which her people need and use.

California has a considerable variety of products, but so large a surplus of oranges, lemons, apricots, grapes, and other fruits that it pays her to export great quantities of these and to import most of her manufactured goods, many of which she could produce at home, though at greater cost.

And so with every part of the country. There is everywhere a surplus of some things and a lack of others.

Hence the need of transportation by sea and land, by which all these surpluses are exchanged, that people everywhere may have such quantities and qualities of everything as they want and can afford to buy.

We have only to look about to see things from every part of the world. At the breakfast table we may have oranges from California or Florida, melons from Colorado or Canada, cereals from Michigan, mackerel from Maine, sugar from Cuba, coffee from Brazil, tea from China or India. The table linen may be from Ireland, the silver from Connecticut, the cutlery from England, the glass from Italy, the china from France.

Naturally, a great deal of capital and labor are required to bring these things from the ends of the earth and to take other things in return.

In the year 1924, according to Lloyd's Register, the shipping of the world was estimated at 64,000,000 gross tons, of which the United Kingdom had 19,000,000 tons, and the United States 16,000,000.

About the same time the railway mileage of the world was 730,000 miles, of which the United States had 264,000 miles; Canada, 39,000; Germany, 39,000; France, 32,000; Russia, 29,000; Australia, 25,000, and the United Kingdom, 23,000.

In the year 1920, there were in the United States over 3,000,000 persons engaged in transportation, of whom about 1,900,000 were in the railway service; 173,000 in water transportation; 1,000,000 in road and street transportation, and the rest chiefly in the express, telegraph and telephone services.

Transportation, of course, includes not merely the carrying of goods and passengers, but communication of information and ideas by mail, telegraph, telephone and wireless.

It is, in fact, a vast system of interchange, by which all parts of the business world are represented in every part, as though reflected in a mirror, and the whole world is being drawn closer together in the bonds of a common life.

SUPPLY AND DEMAND

In early times, when there was no convenient money, most of the trading was carried on by barter, or direct exchange of goods for goods. Yet even then there was supply and demand.

For example, if a hunter had more deer than he needed for himself and his family, and a fisherman had a surplus of salmon, the hunter might offer a deer for 10 salmon, and the fisherman might be willing to give 10 salmon for a deer.

In such a small market, there would be supply of deer and salmon, and demand for salmon and deer. That means that supply of deer was demand for salmon, and supply of salmon was demand for deer. In fact, supply and demand always go together, for they are only two sides of the same transaction, like the two sides of the same shield.

In other words, supply and demand are the same thing from two points of view. What we want to get rid of we call supply, and what we want to get in exchange we say we demand.

And if there were more hunters and a larger supply of deer, and more fishermen who had salmon to spare, it would still be true that the supply of game would be demand for fish, and the supply of fish the demand for game. In brief, supply is demand and demand is supply. This is the master-key of price in any market.

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Nowadays most of our trading is done with money, but the same principle holds good. A farmer sells his corn for money, and with the money he buys clothes and whatever else he may need. Therefore, supply of corn is demand for clothes.

On the other side, the tailor sells clothes for money and buys corn with the money. Therefore, the supply of clothes is demand for corn, and money is only the medium of exchange.

Usually, we think of only one-half of the transaction, so we say that supply is an offer of goods for money, and demand is an offer of money for goods. But as we spend our money sooner or later, it is easy to see that the triangle of exchange—goods for money and money for goods—is only an indirect, though convenient way, of exchanging goods for goods. In this case, as the saying goes, "the longest way round is the shortest way home."

In the business world, supply is not the offering of goods for nothing—that is benevolence or charity. Supply is the offering of a certain quantity of goods at a price.

Again, demand is not just wanting things, or even asking for them. Asking for things without offering to pay is begging, or, possibly, highway robbery. Demand is an effer to buy a certain quantity of goods at a certain price.

The difference between desire and demand is well illustralted in the following verses from "Mother Goose," which are not so silly as they seem:

Simple Simon met a pieman,
  Going to the fair.
Said Simple Simon to the pieman,
  "Let me taste your ware."
Said the pieman to Simple Simon
  "Show me first your penny."
Said Simple Simon to the pieman,
  "Indeed, I have not any."

The Law of Supply and Demand

When we use the word "law," we usually think of a command or edict of God or man, like the ten commandments or the laws of a nation.

But when scientists speak of "law," they mean a rule or regularity or uniformity of things, which is not a command at all, but the orderly way in which nature works, as in the case of the law of gravitation, which merely states that bodies tend to move in a certain way under given conditions.

The law of supply and demand is such a law as this, for it is the rule or way in which the exchange values or prices of goods ond services are regulated by supply and demand. It is also the way in which supply and demand are regulated by prices, for these forces act and react upon one another.

This means that, as a rule, the prices of commodities and services are not accidental nor arbitrarily fixed by the people who sell and buy. On the contrary, they are, for the most part, regulated automatically by changes in supply and demand, to which the sellers and buyers willingly conform or react.

For example, if the world's wheat crop be unusually large, as in the year 1923, the price of wheat is likely to be usually low. And if there is a world shortage the price will be high.

Supply, therefore, is one of the two powerful regulators of price.

The other is demand. If the demand for wheat increases, as it did during the World War, the price is likely to be high. And if it falls off, as it did after the war, the price will probably fall.

So we say that increasing supply and decreasing demand *tend* to lower prices; while decreasing supply and increasing demand *tend* to make prices rise. This is the rule or law of supply and demand.

On the other hand, high prices tend to increase supply and to reduce demand; while low prices tend to decrease supply and increase demand. This is the same law of supply and demand viewed from the side of price.

This law governs the prices of all goods and services; that is, of everything bought and sold.

Where land is abundant, and there is no great demand for it, as in northern Canada, it is very cheap. But where it is very scarce, and in great demand, as in New York or Montreal, the price is very high.

Where capital is abundant and the demand relatively slight, as in most parts of Europe, the rate of interest is low. But where capital is scarce, and there is great need of it, as in America and other new countries, the rate of interest is high.

So, also, with labor and wages. Where labor is plentiful and not in great demand, as in China and India, wages are very low. But where labor is scarce and much needed, as in new and growing regious, wages are high.

Thus, in general, prices are fixed by conditions of the market, over which particular buyers and sellers have slight control, even though, like Chanticleer, they may think that their crowing makes the sun rise.

And when landowners, capitalists, and wage-earners are dissatisfied with their pay, they may help themselves in various ways, but not by denouncing the law of supply and demand. As well might they blame the law of gravitation because they cannot jump over the mountain.

CHANGES IN THE RESERVE FUND

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	$186,917.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	236,513.80*	Mar.	256,586.83†
Oct.	2,723.19†	April	181,694.29†
Nov.	29,302.22†	May	113,284.72†
Dec	234,879.91†	June	92,917.54*

Profit and loss credit.........$137,259.76

Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*	Jan.	$191,381.71†
Aug.	408 570.65*	Feb.	75,469.39†
Sept.	147,204.65*	Mar.	159,985.97†
Oct.	79,421.56†	April	43,542.45†
Nov.	34,226.52†		
Dec.	280,536.75†		

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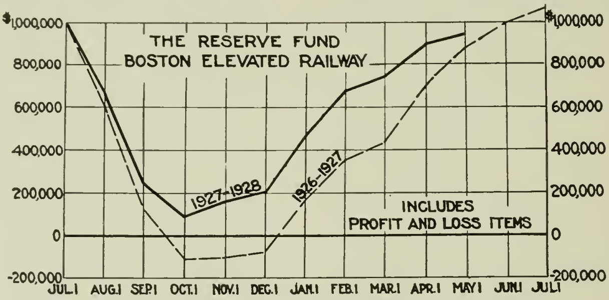
†Excess of revenue over cost of service.

*Excess of cost of service over revenue.



APRIL OPERATION

	1928	1927
GENERAL FINANCIAL DATA		
Revenue exceeded cost of service	$43,542.45	$181,694.29
Operating revenue per car-hour (A.E.R.A. std.)	$6.16	$6.18
Operating revenue per car-mile operated	60.38c	62.24c
Average fare per revenue passenger	9.286c	9.256c
Ratio operating expense to operating revenue	70.28%	67.37%
PASSENGERS CARRIED		
Revenue passengers	30,299,148	31,773,463
Per cent 5c, 6c and 6¼c passengers	18.47%	18.13%
Revenue passengers per car-mile operated	6.288	6.523
OPERATING FACTS		
Trips operated	609,821	625,795
Car-miles operated:		
Rapid-transit lines	1,392,386	1,281,984
Surface, two-man	1,641,147	1,836,541
Surface, one-man	1,310,715	1,282,281
Motor bus	474,225	470,171
Total miles operated	4,818,473	4,870,977
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.595*	1.79*
Accidents per 10,000 bus miles	1.982*	2.38*
Revenue passengers carried per accident	20,520	19,860
Average number of witnesses per accident	3.36	3.31
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	8	8
Employees complained of by car riders	87	91
Car defects reported per 10,000 car-miles	4.0	3.4
INFORMATION ABOUT POWER		
D. c. kw.-hr. output gross for month	21,247,790	20,057,220
Maximum kw. load	77,040	76,160
Tons of coal consumed for power	17,204	17,267
Lbs. of coal for power per d.c. kw.-hr. at cars	1.818	1.933
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	0.907c	0.938c
Per revenue car-mile	4.08c	3.93c
Kw.-hr. per revenue car-mile	4.498	4.186

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*Does not include miscellaneous accidents or **derailments.**

May 17, 1928. EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY
CO-OPERATION

Volume 7 JUNE, 1928 Number 6

Boston Elevated Close-Ups

STRUCTURAL IRON WORKERS
(See Page 93)

To All 'El' Employees

This is a season of the year when traffic begins to fall off rapidly. To a considerable extent ours is a seasonal business. The good weather causes automobile owners to use their machines, schools are closing, vacations are beginning to take patrons away from the city and there is a general lessening of business activites.

In those lines which affect electric railway traffic much of the seasonal fluctuation is beyond our control, but some of it is not.

Every employee directly or indirectly influences the attractiveness of our service. Among the things that can be done that especially affect the public are these:

1. *We can keep our cars clean and neat.*
2. *We can keep them on time, as nearly as street traffic conditions will permit.*
3. *We can operate them smoothly and safely.*
4. *We can show our interest in the success of our business by courteous and considerate service.*
5. *We can boost the service among our friends whenever opportunity offers by explaining the economy, safety, comfort and convenience of travel by train, car or bus.*

Last summer due to the efforts of employees and to Railway advertising the August depression in business was minimized. Our traffic held up considerably better than that of our neighbors. We ought to duplicate or better this record.

A long pull and a strong pull all together will do it.

Edward Dana

NEW GARAGE, FROM GENEVA AVENUE

THE NEW DORCHESTER GARAGE

Garage Is of Most Modern Type and Has Capacity of Fifty-Seven Buses—It Is Located on Large Tract of Land Between Fields Corner Station, Geneva Avenue and Car-House Yard

As part of the extensive development of the Railway property at Fields Corner a large garage has just been completed. It is so located that the capacity can be increased from fifty-seven, as at present, to 113 buses. For this purpose the bus-storage space east of the present garage will be covered by the building. The present garage was constructed with this end in view and the facilities, storerooms, oil and gas supply, toilets, etc., are of sufficient capacity to accommodate the extension when constructed.

Provision for the above-mentioned extension has also been made in the new lobby building and the new heating plant.

The lobby building located on Faulkner Street, opposite Faulkner Circle, is of sufficient size to accommodate not only the operators of trolley cars but bus operators as well. From this building connection is provided with the garage by telephone and call bells for dispatching buses and other uses of the Transportation Department.

The heating plant, just west of the lobby building, will supply heat for the station, the garage, the lobby, and the repair shop. Space has been allowed for an additional boiler.

In the diagram on page 85 the routes of the buses on the station property are shown by arrows. The buses will all enter the garage yard from the busway and leave in an easterly direction either to Dorchester Avenue, alongside the tracks in the car-house yard, or to Faulkner Street or the busway entering the Fields Corner Station from the east.

General Layout of Building

The garage consists of three main divisions, the bus-storage section, the repair-pit section and the office section, the first-named occupying the larger part of the area.

The frame of the building is of steel, the roof being supported by steel trusses from sidewall to sidewall, with no posts intervening.

The roof is covered with precast cement tile, the tile on the sloping parts being of the interlocking type, while on the flat deck the tile is covered with tar and gravel roofing.

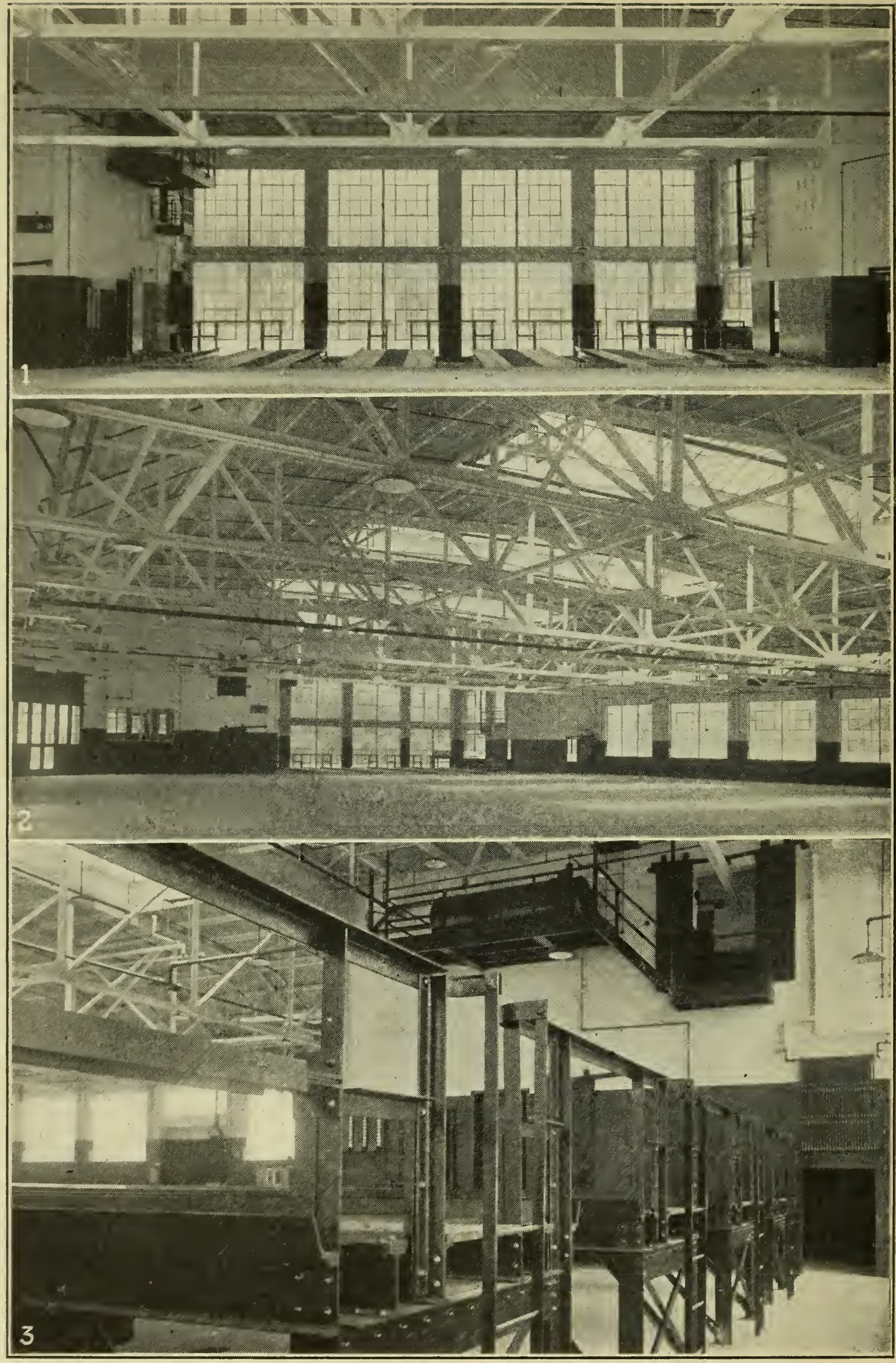
In the roof are four skylights, 15½ by 52 feet in size, glazed with one-quarter inch actinic wire glass. This glass cuts down the intensity of the sun's rays without great loss of light, and also keeps out much of the heat. Each skylight carries three 18-inch revolving ventilators.

Additional natural illumination is furnished through the north and south walls which are practically all glass, supported in factory-type sash with ventilators. The large entrance and exit doors also have glass panels in the lower section in addition to the usual sash in the upper section. (The lower panels are primarily to admit light from the bus headlights when the doors are closed.) Artificial lighting in the bus-storage section consists of 92-watt lamps in 18-inch porcelain enameled reflectors attached to the bottom of trusses, approximately 15 feet above the floor. These are spaced approximately on 14 x 16 foot centers.

The concrete floor of the bus storage section is laid off in sections with 13 floor drains and is so pitched that the buses can be washed in any section with the water running to one or more nearby drains, but the pitch is not enough to cause the buses to roll. Each floor drain is connected with a large gasolene and sand arrester to clear the water before it goes into the sewer.

Entrances and Exits

The entrance doorway, with a 20-foot opening, is at the southeast corner of the



VIEWS IN DORCHESTER GARAGE

1. Runways and lighting in bus-repair section. 2. Looking across bus-storage floor towards bus-repair section. Office section and exit door at left. 3. View from pit floor, showing runway supports, ladders, end of telpher beam, etc.

building. It is closed by a 2-fold electrically operated sliding door. The exit door is at the southwest corner of the bus-storage section, 15 feet wide, the opening being closed by a 6-fold swinging door, hand-operated, three folds operating in each direction. There are also two doors on the east side, opening onto a bus-storage yard which will be used for storing buses pulled off their routes in daytime. (This yard is the extension space already mentioned.)

The walls of the building are of red sandstruck brick, built around the columns carrying the roof trusses, and inside up to a height of 6½ feet the walls are dark green dado, above which they are painted white.

The Pit Section

In the pit section, where repairs are made to buses, the floor is dropped 4½ feet below the main floor of the garage. On the level of the main floor, five flat steel runways, supported on steel frames, extend over the pit area, with guide strips on the inside edges. Buses can thus be run out on the main floor level and work can be done on them from the lower floor, rendering jacking up unnecessary in making repairs.

One runway will be equipped with a modern type of brake-test apparatus to facilitate the adjustment and testing of brakes during repairs.

The work-benches will be located on the pit floor, a notable feature in this garage.

The pit-floor ventilation is provided by a series of small entrance vents in the outside walls and by two horizontal ducts at the rear of the pit. One of the ducts, located low in the pit, contains grille openings through which the air is drawn, passing through a vertical duct which runs above the roof and is capped by a rotary ventilator. The second duct is provided with connections so that the exhausts of any buses in the pit section can be connected to the duct and the waste gases drawn away by suction. This is also connected to a vertical duct running above the roof with a revolving ventilator on top.

By this ventilating plan it will be possible to run a bus engine in the pit section without discharging burned gas or offensive odor into the section.

At each end of the runways provisions have been made for going from one level to the other without passing from one pit to another.

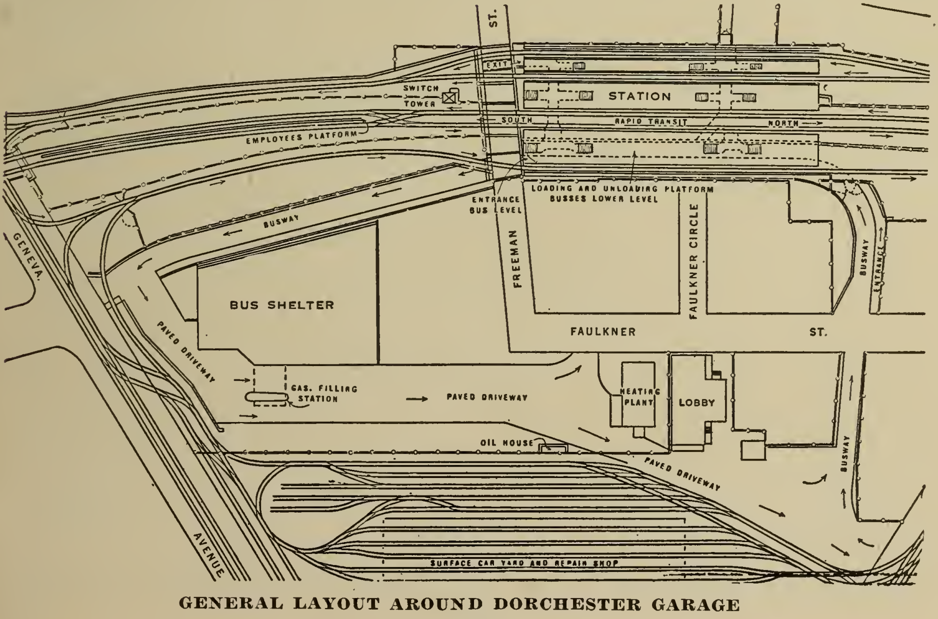
This section is provided with factory-type sash on the two outside walls giving ample daylight, the sash being glazed with actinic glass. The artificial lighting is so arranged as to throw powerful lights on both sides of the buses as they stand on the runways.

In the pit-room section, provision has also been made for a battery-charging room, a bus-cleaners' room, and a main switch room, the last-named being located on the mezzanine balcony just over the battery-charging room.

At the ends of the runways towards the center of the building provision has been made for a traveling hoist on a telpher beam to facilitate handling motors and other equipment.

Office Section

The southwest corner of the building is a 3-floor structure, approximately



GENERAL LAYOUT AROUND DORCHESTER GARAGE

29 x 41 feet in size. In the basement are rooms for oil tanks, storage of heavy automobile parts, tire repair and air-compressor, hot water tanks, gas heaters, etc. On the first floor, which is 3 feet above the main garage floor, room is provided for oil pumps, toilets, the foreman's office and a general stockroom. On the second floor are a general storeroom, a lobby for garagemen, toilets and shower baths.

Filling Station

Outside the building on the south side is a filling station of the island type. In this section are two gasolene pumps, operated by compressed air or by hand. A steam coil inside the shell of each pump will prevent "freezing of the air" in cold weather. On the island also is a small office to provide cover for the records of gasolene furnished to the vehicles. The design provides for an additional filling station when required.

Gasolene is stored in two 2000-gallon tanks sunk in the ground and connected to the pumps on the island.

Roadways Around the Station

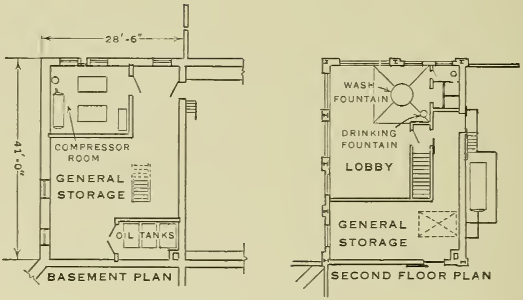
The entrance to the yard is through a 44½-foot opening at the corner of the busway and Geneva Avenue. A driveway approximately 60 feet wide runs from the entrance through the yard to the garage busway entrance. This will be surfaced with concrete and given a slight pitch toward catchbasins connected with the sewer.

The yard will be lighted by means of lamps set on poles well distributed and carrying 94-watt lamps, supplied, as are those inside the building, from the trolley circuit.

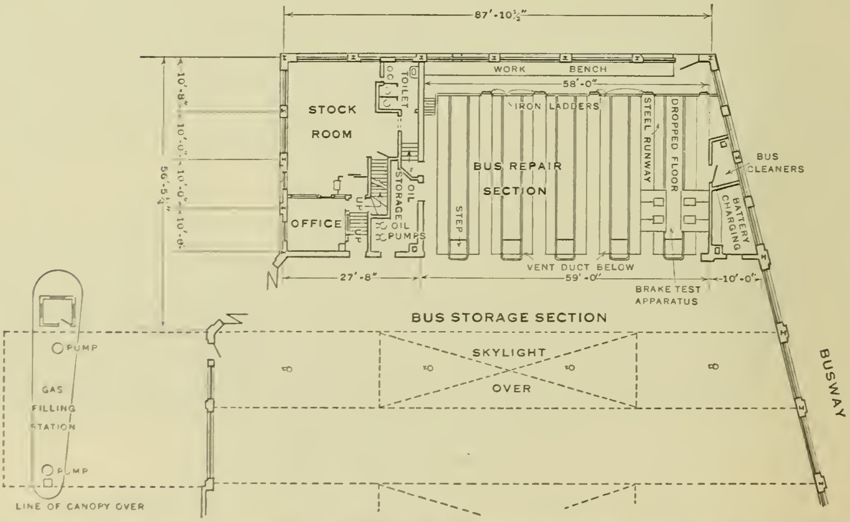
Fire Protection

The building is well sprinklered and connected with the city water system. Hydrants are distributed around the yards and there is a twin connection direct to the sprinkler system on the outside of the building for the use of the fire department. There is one private fire alarm box as well as one connected with the city fire alarm system.

(Please Turn to Page 95)



OFFICE PORTION OF BUILDING



DETAILS OF PIT SECTION AND OFFICE SECTION OF DORCHESTER GARAGE

SEVEN THINGS AN EDUCATION SHOULD DO*

State Official Commends Employees for Their Interest in Their Own Development—He Outlines Some Results Which Should Accompany Real Education, as Formulated in Unusual Conference of Industrial Leaders

By HON. PAYSON SMITH, LL.D., Litt.D.
Commissioner of Education, Commonwealth of Massachusetts

MR. DANA, ladies and gentlemen: It gives me great satisfaction to come here and to have some part in these interesting exercises. As your servant, and as one interested in public education, these new movements in education interest me enormously.

I wonder if we all realize what great progress has been made in education in our Commonwealth in the last fifty years? If we go back over those five decades, we come to a time when there was effective compulsory education in only a few states; and in almost no state was there provision to protect children from child labor, in order that they might enjoy the privileges and opportunities natural to childhood. A half-century ago if a person were so unfortunate as to be blind, deaf or otherwise handicapped he was placed in an asylum or other institution, and he was not given the educational chances that would be his today. Then only one or two institutions in the country opened their doors for the higher education of women; and it is necessary to go back not more than two or three decades to find the beginning of the movement illustrated here tonight, that which has to do with the development and application of knowledge to the practical concerns of life.

Many thousands of employees of companies today, as on the Boston Elevated Railway property, are pursuing educational courses, because there has come this great forward movement among the people as a whole leading to the development of a better understanding of the necessity of applying knowledge to the everyday concerns of life.

In reviewing this situation I can do nothing better in speaking to this group tonight than to bring to you an experience which I had in New York City a few weeks ago. At that time there was gathered together a group of men interested in education, in labor problems and in social problems of different kinds, including men who are concerned in the employment of other men and women in great industrial enterprises. Some one raised this question: "What ought education to do for a man?"

AN UNUSUAL SYMPOSIUM

In order to obtain a consensus of opinion, the leader asked each man present to give his answer to the question, each one to strike successively a new note, not repeating what had gone before. We began with the chairman, a man connected with an organization employing more than fifty thousand people, following with a man who is identified with the labor movement in an important way, and so on.

After forty statements had been given a vote was taken as to the most important seven of these statements. I shall give you those seven tonight.

The first statement was: **Education ought to make a man honest and sincere, particularly sincere.** If education does its duty by a man, it ought to help him to see life straight; to look a fact in the face and see it as a fact, without prejudice, without emotion, but as the thing for which it stands. If education does what it should for a man, it will make him so sincere in his dealings with his fellow-man that he will stand and look him straight in the eye and be prepared to say: "I shall under all circumstances deal with you as man to man."

That interested me particularly because I remembered another statement made by the board of directors of a great corporation to a newly-appointed general manager. His technical and other qualifications had, of course, been studied before his appointment, but afterward the chairman of the board said to him: "Mr. Blank, I should like to tell you the thing which I think is utterly essential to our good relationship. It is this: 'You, under all circumstances, shall be frank, open, honest and sincere in your dealings with us, and we as a board of directors will be the same with you.'" If education is going to do what it should for our people, it is going to help more of us, no matter where we may be working, to stand up, looking straight and squarely into the eyes of our fellows and to be prepared to deal with them honestly, frankly and sincerely.

The second statement was: **Education ought to make a man feel a sense of personal responsibility.** A member of the conference said this: "When a boy comes into my employ, the thing I want of him is that he shall understand that there is a piece of work to be done. It may be little or large but, whatever it is, it is a piece of work for which he is re-

(Please turn to page 94)

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*Abstract of address at closing exercises in educational program, Sullivan Sq., May 3, 1928, Edward Dana, general manager, presiding.

MR. WHITING SPEAKER AT MAINTENANCE BANQUET

By vote of the meeting of the maintenance department conference group, held on Feb. 28, it was decided that the sixth and final conference should be a dinner meeting. Such a meeting was, therefore, scheduled for March 29, a date convenient to the invited speaker, Edward E. Whiting, public trustee, Boston Elevated Railway.

The dinner, served at the Instruction School, was attended by 247 members and guests, most of whom can be seen in the accompanying group picture. Following the dinner, during which community singing was a feature, the tables were removed and a remarkably successful program was "staged." Mr. Whiting entertained the company for a half hour with anecdote, comment and bits of original humor. He was enthusiastically received. Mr. Dana followed with congratulations to the group for the success of the season's activities.

Recitations and songs followed the addresses, and the program closed with an instructive motion-picture film, "This Is the Age of Riveted Steel," loaned by the Hanna Engineering Company of Chicago, Ill.

This closing meeting was in charge of Maj. A. G. Reynolds, group chairman. The cost of the dinner was met by a small charge to the members of the group who attended.

TEAMWORK!

(*"Together we stand—divided we fall"*)

BY JAMES EDWARD HUNGERFORD

We can't play ALONE in the game of life—
Are dependent, my friend, on OTHERS;
We cannot "get by" in the struggle and strife,
Except for the help of our BROTHERS!
Whatever we plan, or whatever we do;
Whatever we give of the best of us,
Is meant to include all our FELLOWMEN, too—
And add to the joy of the rest of us!

Whatever we "vision"; whatever we "dream"—
Be we lowly or lofty of station;
Whatever our "idea," "invention" or "scheme,"
We are working for all of creation!
God's running this world, and His vast Universe,
And blesses the worst and the best of us;
And the gifts He has made to divinely disperse
Are not only for YOU—but the rest of us!

We may call it by this name, or call it by that—
"Teamwork," or plain "Co-operation";
"TOGETHER WE STAND"—by ourselves we fall flat;
TOGETHER, my friend, we're the Nation!
Whatever we do, or whatever we plan—
We can't stand ALONE, e'en the best of us,
But must SHARE of our gifts with our good fellowman—
For we're only a PART of the rest of us!

(All Rights Reserved)

Closing Exercises and Banquet
Maintenence Dept. Conference Group.
Boston Elevated Railway Co.
Sullivan Sq. Hall.
Mar. 29, 1928.

A FITTING CLIMAX TO A F

TORTS OR CIVIL WRONGS*

The Speaker Discussed Slander and Libel, Liability for Negligence, Duties of Carriers of Passengers, Damages, Suits for Death, in Other Words, the Topics of Vital, Every-Day Importance in This Field

By MAURICE P. SPILLANE, Esq.
Claims Attorney, Boston Elevated Railway

THE term "tort" is one of the most difficult in law to define. One of the best definitions is that of the late Professor Bigelow: "A breach of duty fixed by municipal (civil) law for which an action for damages may be maintained." These terms are to be understood in their technical sense and not in their popular sense.

In general, to maintain an action of tort there are four requisites to cover:

1. Legal duty owed plaintiff.
2. Breach of duty by defendant.
3. Damage, actual or nominal, to plaintiff.
4. Plaintiff's conduct must have been free from fault as a general rule.

Civil wrongs which affect one's safety, freedom, home, reputation or estate have been divided by Pollock into three groups:

1. Personal wrongs.
2. Wrongs to property.
3. Wrongs affecting both person and property.

Personal wrongs include:

1. Those affecting the safety and freedom of the person, such as assault, battery and false imprisonment.
2. Wrongs affecting personal relations in the family such as seduction, enticing away servants, etc.
3. Wrongs affecting reputation, such as slander and libel.
4. Wrongs affecting one's estate generally, such as deceit, slander of title, malicious prosecution and conspiracy.

Wrongs to property include trespass, conversion, interference with certain property rights such as private franchises, patents, copyrights.

Wrongs affecting both person and property include nuisance, negligence and breach of certain absolute duties.

SLANDER AND LIBEL

Slander and libel are different names for the wrong of defamation, slander being oral and libel written or printed. One may be libeled by an image or picture.

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*Abstract of the eighth lecture in the course in Everyday Law, F. W. Casey and E. M. Brooks, committee in charge, delivered at Franklin Union and Sullivan Square, Monday, Feb. 20, 1928.

Slander is always a civil wrong, but libel may be either civil or criminal. We are not now concerned with the criminal side.

Four classes of actionable slander in which special damages need not be proved are:

1. Where the words used impute a criminal offence punishable by imprisonment.
2. Where the words used impute the having of a contagious or infectious disease of a disgraceful kind.
3. Where the words used convey a charge of unfitness, incompetence or dishonesty in one's office, business or occupation.
4. Where the defamation is a libel, that is, any writing, picture, print or effigy calculated to bring one into hatred, ridicule or contempt.

In all cases of defamation there must be publication, that is, the words must be heard or read by a third person or persons capable of understanding what is said or written.

For example, accusing a Greek of larceny in Greek which is not understood by other persons present is not a publication. On the other hand a libelous letter dictated to a stenographer amounts to a publication, as does also delivering a libelous message to a telegraph company.

Accusing a person of being a thief, burglar, perjurer, murderer, swindler or bootlegger gives one a right of action without proving special damage. However, all words charging one with a crime are not actionable *per se*. Thus charging a man with violating the speed laws or begging would not be actionable *per se*, but if the crime charged would subject a man to a time in prison or if a conviction of the offence charged would subject the person accused to disgrace there would be cause of action.

Similarly the language used must relate to a *present* or *past* offence to be actionable.

The actionable wrongs relating to contagious diseases may be illustrated by the case of leprosy. To charge a person with having leprosy would be actionable because this tends to exclude the person from society. The charge must be in the present tense, for to accuse a person of having had a contagious disorder is not actionable. Charging a person with being insane is not actionable, as insanity is not a contagious disease.

The third class of actionable wrongs in which special damages need not be proved comprises imputations touching one in his occupation. Thus to charge a clergyman with profanity is actionable because of the peculiar position that he occupies in the community, whereas it is not actionable to charge a clergyman with ignorance. On the other hand, charging a teacher with ignorance of a subject which he professes to teach is actionable. So it is to charge an attorney with cheating his clients or keeping their money.

The Law of Libel

Libel is broader than slander. Many words orally spoken are not actionable *per se*, but become so if printed. Such, for example, as any accusation which brings dishonor to one's good name.

In all actions for defamation that is slander or libel the defendant may show the truth of the accusations and if he does so this is complete defense. By statute in Massachusetts, truth is a justification unless malice is shown in actions of libel. However, failure to prove the truth is not of itself evidence of malice. By malice is meant an evil motive, a desire to cause injury or seek revenge.

A defendant may also show privilege, so called, that is a superior or limited right to inflict harm on another. The State acting through its executive, for example, should be free in carrying on its work. It would defeat the purpose of the State to permit inquiry into the motives of those who are performing its work.

Thus no action can be maintained against a member of the legislature for anything said or done in the discharge of duty. This privilege is only absolute within the walls of the House or committee rooms.

The same privilege is extended to persons summoned to appear before legislative bodies or who come voluntarily in exercise of their rights or discharge of duty.

Statements made before a court or in judicial proceedings are absolutely privileged whether made by the parties to the cause, by witnesses or by attorneys.

There are occasions of privilege which are qualifiedly so, that is, the privilege disappears if malice is shown. This applies to proceedings before clubs, societies, etc.

Communications may be privileged when given in connection with matters of legal or social duties such as confidential reports made to a superior, giving character of a servant or giving information intended for the public welfare. In all such cases the person receiving the communication must have a corresponding duty or interest. Thus I may tell a partner in business that I suspect an employee of being dishonest, but I cannot make such a statement to one having no interest in my business.

Also, if my character is assailed in public print I may make whatever reply is reasonably necessary for my own vindication.

Ordinary newspaper reports, if substantially correct and fairly made, are within the class of *prima facie* privilege, but newspapers as such have no peculiar privilege.

Criticism fairly and honestly made is not defamation, although it may be severe or unjust. One must, however, refrain from making untrue statements of specific acts of misconduct or holding character up to ridicule. Thus it is all right to say of a painting, "It is a daub," or of a book, "That it is trash."

The burden of proving the truth of an allegation of a defamatory nature is on the defendant. The burden of proving malice is on the plaintiff.

NEGLIGENCE

Another phase of the subject covered by this lecture is negligence. "This signifies primarily want of care, caution, attention, diligence, skill or discretion in the performance of an act by one having no positive intention to injure the person complaining thereof. It also includes every omission to perform a duty imposed by law for the avoidance of injury to person or property."*

Negligence, therefore, may consist of a careless act or an act of omission. But mere negligence gives no right of action unless there be a breach of duty, a violation of some duty implied by law, created by statute, or by contract, and resulting in damage to the plaintiff,

In other words, there must be negligent conduct, breach of duty and damage.

The mere fact of injury is not enough to establish liability, for no one is responsible for injury caused by inevitable accident. Thus, a conductor of a street car pulling a bellrope at the same time a passenger is arising from his seat may result in the conductor's elbow striking the passenger in the face. This has been held to be a pure accident.

Breach of duty has been referred to and it is important to know what we mean by "duty." This may be created by statute, ordinance, contract or voluntary assumption.

Driving on the right side of the road, driving at certain speeds where regulations apply, rights of way at intersecting streets, etc., are examples of duty created by statutes.

Examples of duty created by contract are those involved in the carrying of goods or passengers, and in the relation of master and servant.

As to duties voluntarily assumed, a case in point is one in which a caterer furnished food to an assembly of persons, many of whom were made ill because the food was not fit to eat. The caterer in this case was held liable.

The law recognizes different degrees of duty owed to persons in different situations, such as the high degree owed to a passenger by a carrier, the lesser degree owed to a licensee or invitee and the absence of duty to trespassers excepting to refrain from deliberate or intentional injury.

When there is no contract between the parties, generally speaking, nothing is to be inferred from the mere happening of an accident and the burden of proving negligence is on the plaintiff.

There are instances, however, where negligence may be presumed in accordance with the doctrine of *res ispa loquitur;* in other words, "the thing speaks for itself." This, a traveler on a highway injured by a barrel of flour falling on him from a warehouse was not required to call witnesses to prove negligence. It is the duty of persons who put barrels of flour into a warehouse to take care that they do not roll out. This doctrine applies to collisions of cars, derailments, falling roof of a car, falling buildings, etc. It does not apply to collisions between street cars and automobiles, or other vehicles. Similarly a person keeping a dangerous or vicious animal with knowledge of its habits is bound to keep it secure at his peril. If it escapes and does damage he is liable without proof of negligence.

As suggested earlier the owner or occupier of premises owes no duty to a trespasser except to refrain from wanton misconduct. He cannot set spring guns or vicious dogs on the trespasser, but he is not bound to protect him or provide safeguards. No duty is imposed by law upon him to keep his premises in suitable condition for those who come there solely for their own convenience or pleasure. In connection with the subject of trespassers it is interesting to know that unregistered or improperly registered automobiles have been held in several Massachusetts cases to be trespassers.

A mere permission to enter or pass over an estate will not create a duty for the owner to provide against danger of accident. But if he directly, or by implication, induces persons to enter or pass over his estate he assumes such an obligation.

One has a right to use his land for any lawful purpose for which, in the natural course of enjoyment, it can be used, but if he accumulates on his land anything which, if it should escape, might cause damage to his neighbor, he does so at his peril. If it does escape and cause damage he is liable.

Thus a person must at his peril keep ice or snow that collects on his roof within his own limits. He is responsible for all damages if the shape of his roof is such as to throw ice or snow on his neighbor's land in the same manner as if he threw it himself.

CONTRIBUTORY NEGLIGENCE

Negligence on the part of a defendant is not enough to entitle a plaintiff to a verdict. One cannot recover damages if his own negligence proximately contributed to produce an injury. If one crosses a crowded thoroughfare without looking out for his own safety and is knocked down by a street car or an automobile, his act was a careless one and contributed directly to his accident. He is bound by his own careless act.

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*Sherman and Redfield on negligence.

Contributory negligence is not a bar where there is wanton or wilful misconduct. In one case the plaintiff was a lame woman on crutches, who boarded an electric car at a rear step. The vestibule door being closed, she rapped on the door for the conductor to open it. He shook his head, gave the starting signal and she was thrown off. While the plaintiff was technically a trespasser it was held that she could not be wilfully molested or dealt with to her harm or injury.

There are instances where one's act may contribute to his injury, but without fault, and in such cases the plaintiff may recover. Thus the controller of a trolley car may flash, causing smoke and flame to appear. The passengers may jump off the car or go out through the windows. While, in a sense, their actions have contributed, in a great measure, at least, to their injuries, they are still entitled to recover.

By statute of this Commonwealth passed in 1914 in all actions, civil or criminal, to recover damages for injuries, the person injured or killed shall be presumed to have been in the exercise of due care. Contributory negligence must be set up and proved by the defendant. This presumption is not evidence, but it stands until evidence showing the facts is produced.

Imputed Negligence

Imputed negligence is involved in cases where the negligence of a third person, other than the plaintiff, might be charged or imputed by the plaintiff and bar his recovery. This doctrine applies in three classes of cases as follows:

1. *Where a passenger is injured by the contributing negligence of his carrier and the negligence of a third person.* For example, a passenger on an electric car may be injured by a collision between the car and a truck, both operators being careless. As a general rule, the passenger is not bound by the contributory negligence of his carrier.

2. *Where a parent and child are involved.* Thus an infant is chargeable with any negligence of his parents or guardian in putting or keeping the infant in a position of danger. In one case a mother was held to be careless in permitting a child three years old to go on the street with his brother, aged seven. A child is entitled to a parent's vigilance and forethought.

3. *Where guests are carried in a private conveyance.* Unless he is in a position to exercise control over the driver or absolutely surrenders his safety or care to a driver a guest is not bound by the contributory negligence of the driver. Just what care the guest should exercise depends on circumstances. Thus, if in an open team approaching a railroad crossing a guest, having a chance to observe impending danger, does not warn the driver he is barred from recovery. In general, however, the contributory negligence of a third person should not bar an innocent party from recovering against one by whose lawful act he was injured. A guest has no right of recovery from the owner for his or the operator's negligence, however, unless he could show gross negligence on the part of the owner or operator.

Negligences are of three kinds—slight, ordinary and gross. Glancing over the first of these as unimportant, it may be noted that ordinary negligence is a breach of duty and failure to exercise ordinary care to prevent injury. Gross negligence is a heedless and palpable violation of a legal duty respecting the rights of others. All negligence differs from wilful and wanton conduct in that in the former there is nothing more than carelessness, although it may be great carelessness, while in the latter there is a wilful intentional wrong or reckless disregard for possible consequences, imputing a wilful wrong.

Liability of Carriers of Passengers

All users of highways, including street railways, have the duty of being careful, not careless or negligent. In general all have equal rights, but each is required to regulate his movements and speed to avoid collision. When collisions occur the question of due care and negligence is generally for a jury to decide.

Toward a passenger a carrier is bound to use the highest degree of care commensurate with the mode of transportation and the practical operation of its railway. This, however, does not imply that the carrier is an insurer or a guarantor of the safety of passengers.

Any person who has boarded, or is in the act of boarding, a street car is a passenger as a general rule. If he has a ticket or is ready to pay his fare when demanded, that is enough. He must, however, present himself in a proper manner and be accepted before he becomes a passenger. A carrier must allow passengers reasonable time to board and alight and is liable for starts or motions which throw and injure persons boarding or alighting. Once on a car, however, there is no obligation to wait until a passenger is seated, but the start or stop must not be violent or with sufficient jerk to throw passengers. The carrier must also use reasonable care to

ELEVATED CLOSE-UPS

Structural Iron Workers

(See illustration on front cover)

THE men shown on this month's cover are structural iron workers, engaged in driving rivets. The principal duty of the structural iron workers is to make repairs to the 11 miles of elevated structures, but they also erect and maintain all steel members of buildings, and maintain the steel members in subways and tunnels, make repairs to stair treads, fences, railings, etc., and miscellaneous repairs to maintenance department equipment.

In the elevated structures there are approximately 48,000 tons of structural steel. The field connections, or rivets, which holds the transverse girders to the columns and the longitudinal girders to the transverse girders, as well fasten as all vertical and horizontal braces, number about 500,000.

The structure is under constant inspection and any loose rivets are marked, cut out and replaced, averaging approximately 10,000 feet each year. The work of replacing loose rivets is fairly difficult, as it has to be done from stages suspended from the elevated structure and precautions have to be taken to avoid contact with the third rail, trolley wires and feed wires.

A riveting gang consists of four men. The "heater" takes the cold rivet and heats it to the correct temperature for driving. If it is not hot enough, it will not properly upset and fill the hole; if

(Please turn to Page 95)

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protect his passengers from violence from unruly or obnoxious persons.

DAMAGES

A party suffering an actionable wrong is entitled to damages, which may be nominal, ordinary, exemplary or punitive. In Massachusetts there are no punitive damages.

In cases of personal injury, one recovers not only his actual loss or actual damage, but also for that indefinite item known as pain and suffering. In this Commonwealth there can be no recovery for fright, terror or mental distress unless there be some physical injury, however slight.

Damages for a cause of action are assessed for all time; if one recovers for personal injuries and later finds out they are more severe than was supposed, he cannot maintain another action.

PENALTY FOR FATAL ACCIDENT

If a railroad or railway, through its negligence, or by reason of the unfitness or negligence of its servants or agents, causes a death of a passenger or of a person not a passenger or in the employment of the corporation, it is punished by a fine of not less than $500 or more than $10,000 to be recovered by indictment prosecuted within one year, or may be received in action of tort brought within one year and assessed with reference to the degree of culpability.

The amount recovered is not damages as such, it is a penalty recoverable as a gratuity from the Commonwealth. The money so recovered is no part of the estate of the deceased, and it cannot be taken for his debts or expenses of administration. Also the deceased cannot release any action his estate may have for his death because it is a cause of action over which he has no control, it does not accrue during his life, it is not for the benefit of his estate, and it is a penalty imposed for death.

MR. SPILLANE'S ANSWERS TO QUESTIONS

Following the lecture Mr. Spillane answered a few questions substantially as follows:

Q. In the case of injury in an automobile is it not always an important question for the jury whether or not the person on the back seat surrendered all control to the driver?

A. Yes, that is always a question, unless the guest is foolish enough to say that he has absolutely surrendered himself to the driver. All he has to do when on the stand is, "Yes, I was looking out for myself and observing what he was doing, telling him at times to go slower, that a car was coming, to look out, or whatever the caution might be." That is sufficient.

Q. And then the passenger might recover?

A. Yes, if the evidence bears out the contention.

Q. How would it be in a taxi case?

A. The position there is different. The taxi company is a carrier and there is a contractual relationship. The passenger is not a guest in this case.

Q. If I were driving along and one of these "thumb-up" fellows asked for a ride and I took him on the car and later got into an accident, would I have any liability as far as he is concerned?

A. No, unless you were grossly negligent. In general, there is no recovery against you in that case.

(Continued from Page 87)

sponsible. If we can, through education, help our boys and girls to grow up to be the kind of men and women who will carry their own responsibility, education will be worth while."

I somehow feel that the element of personal responsibility is needed not only in industry but in every walk of life, including politics. Lack of one type of responsibility was illustrated to me by a conversation which I overheard some years ago between two workmen. An amendment to the constitution of their state was being voted upon. Said one: "There must be an election in town today," to which the other replied: "That's so, the polling booths are open." After some discussion of the lack of pictures of candidates on the billboards, advertisements, etc., one said: "And there are no automobiles out to carry voters to the polls." "Well," replied the other, "they don't get me to no polls unless they get out an automobile to take me there!"

My friends, in many communities there is too much automobile citizenship and not enough of that kind of citizenship which walks up to the polls over its own shoe leather and under its own hat and casts its own vote on its own convictions of what ought to be.

The third statement was: **Education ought to help a man to get the right perspective of life.**" What does that mean? It means that the truly educated man will have the ability to put important matters where they belong, in important places, and let unimportant matters go where they belong. I know more than one man who has not succeeded as he should because he allowed his mind and strength to be absorbed by unimportant things.

As a schoolmaster I remember that I used to go on occasion for advice to a friend. One day, utterly discouraged with the results of my work, I went to him to express my sense of failure. His reply was, substantially: "You will never make a success of teaching or anything else until you learn one lesson, namely, that there are some issues in life that are important and others that are unimportant; and if you let yourself fret and suffer on account of unimportant things, when you ought to be giving your strength to the important issues of life, you are already a failure."

I have tried to remember what my friend said, for I saw that education should give such a perspective as he described. I think that education ought to give us such a perspective of life that we can have a good time. We all ought to go through life having a good time. We should not be like the woman school teacher who lived in a fine big colonial home in the beautiful town of Plymouth. The obituary on her tombstone states that she was unhappy in her teaching and was glad to escape from this vale of tears in the early twenties to go to a sunnier and happier place. I should rather have on my gravestone the inscription said to be on that of a woman buried somewhere in New Jersey, comprising only this sentence: "She had a good time."

In the larger sense education ought to enable us to go through life getting out of it all the rich things that it can give. You will not be surprised, therefore, to know that the fourth statement that was given at our New York conference was: **Education ought to enable one to enjoy the margin of life.** To do this it is desirable that everyone have a hobby of some sort, cultivating flowers, collecting postage stamps, tampering with a Ford automobile engine, or what not. The hobby concerns the margin of life.

A wise Chinese statesman was one day taken through the New York subways. The guide said: "If we take this train we shall save some time. We shall get to our destination some ten minutes earlier than we should by the local train." The wise Oriental, with his Eastern point of view, said: "That is splendid, but what are we going to do with the ten minutes after we have saved them?"

That is a problem of society today. Hours of labor are being shortened; productive machinery is giving our people a larger margin of life. What will they do with it? Will they stand around on the corners and smoke, whiling away the additional time? We have got to enrich our lives so as to enjoy this margin.

The fifth statement was: **Education should develop the imagination.** Now I know that a bad imagination is a very bad servant. The imagination that sets one to day-dreaming and waiting for something to happen is not a good servant. On the other hand, the motive power of industry, of progress, is imagination. Young Lindbergh could never have made his marvelous flight without it. Every ounce of progress, every bit of advance that this world has made and is making is due to a useful, active, practical imagination.

You people before me should set your imaginations to improve your own affairs and the affairs of the Boston Elevated, until one day we can say that we have the best system in the world. Imagination, with the application of definite knowledge, will bring this about.

The sixth statement was: **Education ought to make it possible for a man to express himself clearly by speech or writing.** An investigation made some years ago by the Massachusetts Institute of Technology among its alumni brought out the conviction of former students that one of the most important improvements that could be made in the curriculum was to "Teach the boys to express themselves." One man said that he could solve engineering problems but concluded: "Where I fall down is when I go before a board of directors or a group of laymen and try to tell them what is in my mind." It is important that knowledge be released in order that others may share it. Hence I speak with approval of the men and women before me who have undertaken courses in English, in expression. You will find that this is going to enrich your lives in many ways.

The seventh statement was: **Education should give an understanding of the place of law in the life of the individual.** We are living in a time when external authority does not speak as it once did. Everyone nowadays is going to decide for himself the questions that are before him. Decisions, however, must be based on reason, not on whim or impulse. The young people of today are deciding questions which their fathers and mothers used to decide for them, and this is creating problems. A friend said to me recently: "There isn't any more the authority in American homes that there used to be." I replied: "You are mistaken; there is as much authority as ever. It has been transferred, that is all. The fathers and mothers used to have it; now the children exercise it." And, in my opinion, the young people are doing very well, especially when their greater opportunities for doing otherwise are considered.

As we go forward in the program of education for our children, we should understand the importance of the right attitude toward law. They cannot break moral, spiritual or physical law without suffering disaster. They must learn that law is a good thing; a friend not a foe. It does not tie down, but rather liberates. To illustrate by the laws of health: A person who understands and follows these laws has opened a door which leads into a life of physical happiness and welfare.

Similarly with the law of thrift. If we give a boy the law of thrift, the relationship between income and outgo, the relationship of the dollar to daily life, we are furnishing him with the key that opens the door to financial independence, to freedom from the slavery of debt and other economic burdens.

Go back to your homes and impress upon the young people of your families the importance of keeping the law, and let them understand that the law is helping them.

In closing, permit me to express my feeling of certainty that in the courses you have taken you have found something worth while, and that the educational work you have done here and that you will carry on through life will not only enrich your own lives but those of your families as well. This will be of immense benefit to the state, to the community, to the industry which you serve and to our nation.

I wish for each of you that many of your finest dreams will come true, leaving just a few not fulfilled in order that there may still be a challenge that will lead you on into the higher and better ways of the future.

NEW DORCHESTER GARAGE

(Concluded from Page 86)

Miscellaneous Equipment

On the main garage floor level are oil pumps to draw oil from the storage tanks in the basement of the office section. Tanks are filled from this floor level. The tanks are equipped with automatic gauges to indicate the level of oil in them.

The air compressors located in the office section provide air supply at various points in the garage for the inflation of tires.

A number of small machine tools will be located on the garage floor and on the pit floor for use in making repairs.

ELEVATED CLOSE-UPS

(Concluded from Page 93)

too hot, the rivet will be brittle and the head will probably fall off. The "passer" takes the hot rivet from the "heater" and places it in the hole. The "bucker-up" holds the dolly bar, as it is called, against the rivet head, while the "driver" uses the pneumatic hammer to form the head and drive the stock home.

Recently a change was made in the elevated structure at Sullivan square due to widening the square, which required the removal of a column and the splicing of a transverse girder. During the work the operation of the trains was not interfered with. The longitudinal girders were shored up, the column was removed, and the transverse girder spliced and lengthened, put in place and riveted.

On account of the widening of Causeway Street, it will be necessary to move four columns which are now in the street. This will require lengthening four of the cross girders, with the incidental work in connection therewith. While this work is going on, the longitudinal girders will be held in place by shoring. The work will be carefully planned, so that no accidents will result and no injury sustained by car-riders or the people using the street.

While the steel worker's job is hazardous, the percentage of serious accidents is extremely low, owing to the great care taken by these men.

CHANGES IN THE RESERVE FUND

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	$186,947.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	236,543.80*	Mar.	256,586.83†
Oct.	2,723.19†	April	181,694.29†
Nov.	29,302.22†	May	113,284.72†
Dec.	234.879.91†	June	92,917.54*

Profit and loss credit.........$137,259.76

Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*	Jan.	$191,381.71†
Aug.	408,570.65*	Feb.	75.469.39†
Sept.	147,204.65*	Mar.	159.985.97†
Oct.	79,421.56†	April	43,542.45†
Nov.	34,226.52†	May	93,645.42†
Dec.	280,536.75†		

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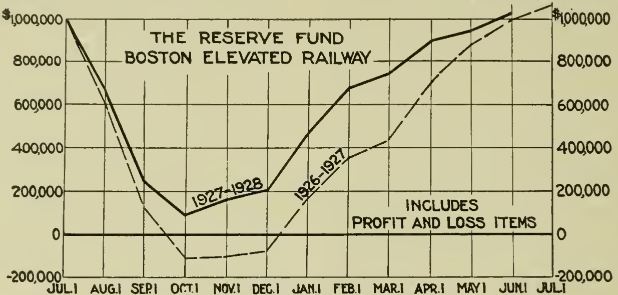
†Excess of revenue over cost of service.

*Excess of cost of service over revenue.



MAY OPERATION

	1928	1927
GENERAL FINANCIAL DATA		
Revenue exceeded cost of service	$93,645.42	$113,284.72
Operating revenue per car-hour (A.E.R.A. std.)	$6.09	$6.04
Operating revenue per car-mile operated	59.97c	60.75c
Average fare per revenue passenger	9.273c	9.236c
Ratio operating expense to operating revenue	69.54%	69.05%
PASSENGERS CARRIED		
Revenue passengers	31,158,861	31,310,257
Per cent 5c, 6c and 6¼c passengers	18.63%	18.52%
Revenue passengers per car-mile operated	6.200	6.341
OPERATING FACTS		
Trips operated	635,907	633,686
Car-miles operated:		
Rapid-transit lines	1,465,047	1,302,110
Surface, two-man	1,716,132	1,855,118
Surface, one-man	1,345,025	1,298,297
Express, newspaper and sprinkler cars	948	814
Motor bus	497,978	481,812
Total miles operated	5,025,130	4,938,151
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.78*	1.89*
Accidents per 10,000 bus miles	2.13*	2.59*
Revenue passengers carried per accident	19,920	18,250
Average number of witnesses per accident	3.18	3.66
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	5	11
Employees complained of by car riders	89	111
Car defects reported per 10,000 car-miles	3.4	3.4
INFORMATION ABOUT POWER		
D. c. kw.-hr. output gross for month	18,747,470	17,738,420
Maximum kw. load	65,580	63,060
Tons of coal consumed for power	15,352	15,384
Lbs. of coal for power per d.c. kw.-hr. at cars	1.840	1.948
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	0.994c	1.013c
Per revenue car-mile	3.76c	3.69c
Kw.-hr. per revenue car-mile	3.783	3.644

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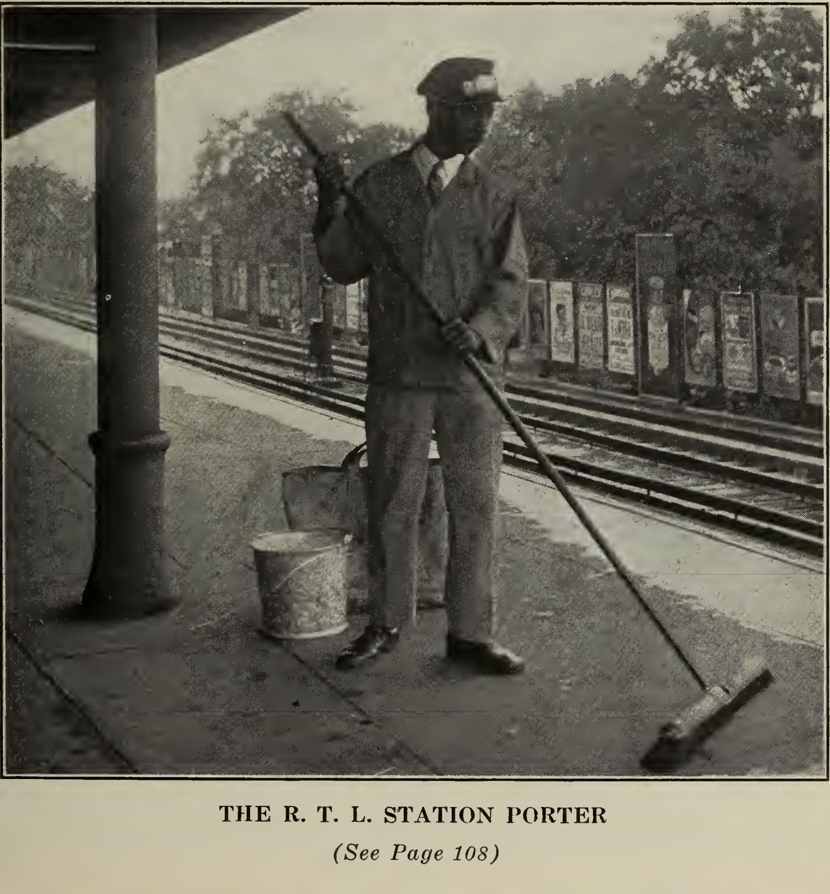
*Does not include miscellaneous accidents or derailments.

June 21, 1928 81 EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY CO-OPERATION

Volume 7 JULY, 1928 Number 7

Boston Elevated Close-Ups



THE R. T. L. STATION PORTER

(See Page 108)

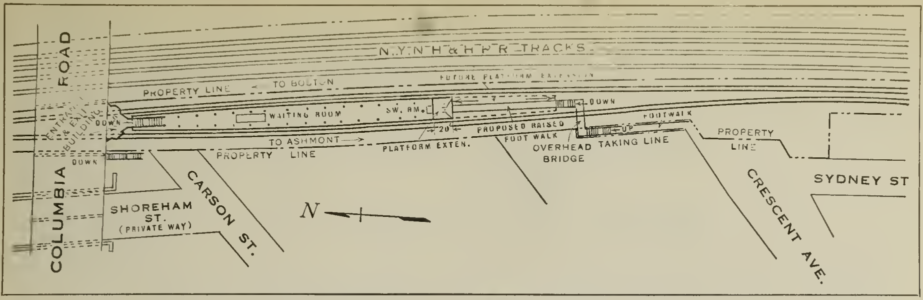
To All 'El' Employees

For the first time in the history of the Boston Elevated a passenger has been killed in an elevated train. When men in car and train service go on duty they have the responsibility of keeping ever before them the safety of those being transported. Some employment simply involves the individual and his own safety. It is not so with public transportation. Inattention to duty, indifference and actual carelessness in transportation service must be avoided when on duty all of the time.

Let the sad occurrence of Sunday, July 22, 1928, bring home the character of the responsibility of this undertaking.

Eternal Vigilance is the Price of Safety

Edward Dana



CHANGES AT COLUMBIA STATION

TWO RECENT STATION IMPROVEMENTS

A New Entrance From the South to Columbia Station on the Dorchester Rapid-Transit Extension and a New Exit Stairway at Kendall Square Station, Cambridge Subway, Will Facilitate the Use of These Stations

IN order to adapt the railway property to the requirements of the public, changes and modifications are continually being made. Among the recent interesting improvements are those at the two stations mentioned.

New Entrance at Columbia Station

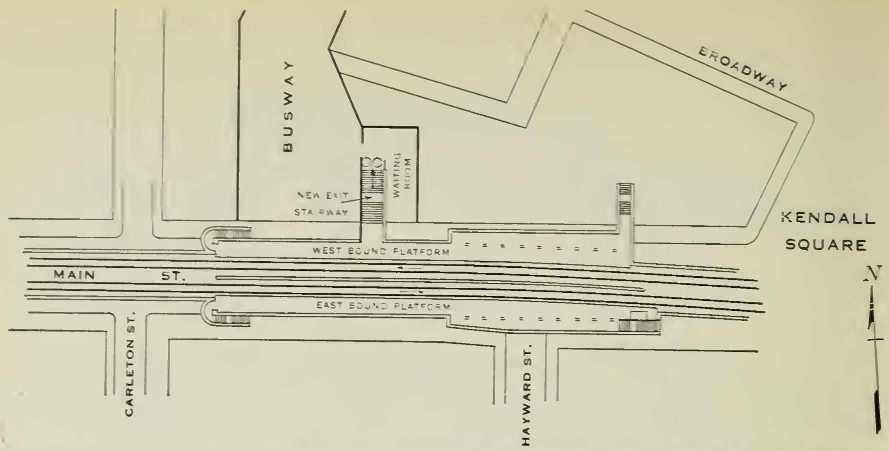
As a means of providing convenient entrance for persons living in the district between Romsey street and Crescent avenue the trustees of the Boston Elevated Railway have requested the Transit Department to build an entrance from Crescent avenue to the Columbia Station platform of the Dorchester Rapid Transit extension.

When the entrance is completed persons living in this district may reach the Columbia Station platform by ascending a stairway, crossing a bridge over the outbound track, and descending a stairway from the bridge to a raised walk, all 8 feet in width, connecting with the south end of the platform.

The new entrance is shown in the accompanying line drawing. A drawing of the complete station, before the improvement, will be found in the issue of "Cooperation" for July, 1927, page 99.

In order to provide this convenience, it was necessary for the Transit Department to acquire additional land and to extend the concrete platform approximately 20 feet. When later the permanent platform is extended for about 135

NEW TURNSTILES AT KENDALL SQUARE STATION



KENDALL SQUARE STATION, WITH NEW EXIT STAIRWAY AND WAITING ROOM

feet to accommodate 6-car trains, the descending stairway from the bridge will be at approximately the end of the extended platform, and the extension of the platform which is to be made at this time will become a part of the further extension when 6-car trains are operated.

The estimated cost of this added improvement will amount to $14,600.

Kendall Square Improvements

On July 14 a new exit stairway leading from the westbound platform of Kendall square Station, Cambridge Subway, to the newly constructed waiting room in the bus area, between Broadway and Main streets, near Kendall square, was opened for the use of the public.

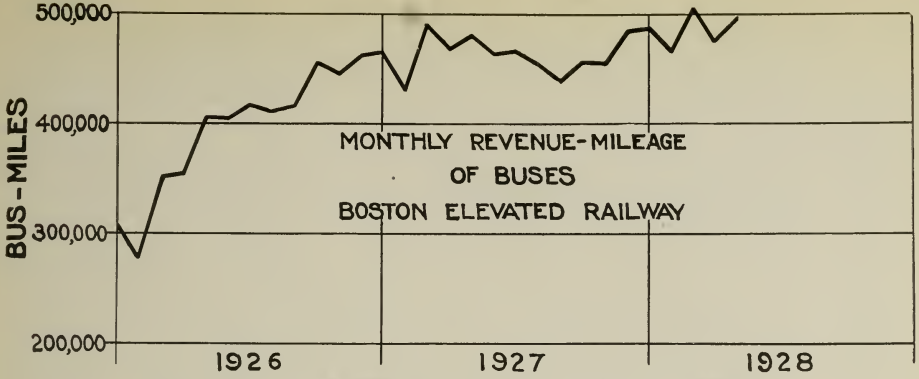
This stairway is located near the center of the Kendall square westbound platform. It leads directly into the bus waiting room and provides for more convenient interchange between outbound passengers from Boston to buses used in the Cambridge district. Passengers leaving the Cambridge Subway trains can go directly up these stairs to the waiting room, which is lighted, heated and comfortably arranged.

This arrangement will permit passengers to wait with protection from the weather until the bus they desire to take arrives, notice of which is given by the starter at this point.

The stairway is 12 feet wide and constructed of concrete, the side walls being tiled to match the ornamentation in the Kendall square Station. At the top of the stairs are exit turnstiles, to prevent persons from entering Kendall square Station by this stairway.

The total cost of this work was approximately $16,000.

LOOKING UP THE NEW STAIRWAY AT KENDALL SQUARE STATION



MONTHLY BUS MILEAGE PASSES HALF-MILLION MARK

BUS MILEAGE GROWING STEADILY

The accompanying chart of bus mileage shows a substantial increase in monthly revenue-mileage, although the rate of increase, of course, is not as rapid as that for the preceding three years, as shown in the diagram printed in the May, 1927, issue, page 75. For January, 1928, the mileage was 56.6 per cent greater than that for January, 1926. The average monthly mileage for 1926 was 393,158, that for 1927 was 463,580, and that for the first five months of 1928 was 486,515. In March, 1928, the monthly mileage exceeded 500,000, reaching 507,862 bus-miles.

SUPERVISORS' ASSOCIATION APPOINTMENTS

President Banks has made the following appointments to the Board of Control of the Boston Elevated Railway Supervisors' Association:

C. H. Dey, assistant engineer, department of power.

M. J. Curtin, supervisor yards and stores, maintenance department.

P. E. Maw, district supervisor, Forest Hills Station, R. T. L.

J. M. Patten, foreman truck shop, rolling stock and shops department.

The above, with the officers elected at the meeting held on May 16, constitute the Board of Control. This, therefore, in addition to the men mentioned, includes:

President, J. P. Banks, supervisor, transportation department.

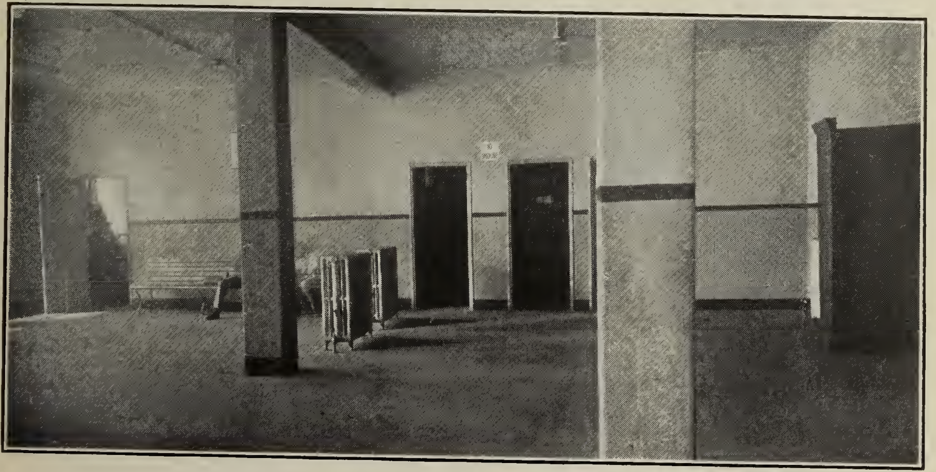
Vice-president, Thomas Kivell, trackmaster, maintenance department.

Vice-president, J. A. Smillie, foreman, rolling stock and shops department.

Vice-president, E. L. Doyle, assistant engineer, department of power.

Secretary-treasurer, J. L. Troy, transportation department.

The plans of the Board of Control for the program for the coming season, which will open in October, will soon be ready for announcement. One feature already decided upon is to begin each meeting with a short business session to provide opportunity for discussion of topics of association interest.



INTERIOR OF NEW WAITING ROOM AT KENDALL SQUARE

COMPARATIVE DIVISION OF RECEIPTS AND EXPENDITURES FOR THE YEARS ENDING JUNE 30

(See Chart page 103)

	1928	1927	1926	1925	1924	1923	1922	1921
Total Receipts	$35,009,933.28	$35,618,066.06	$35,087,815.89	$34,198,250.91	$34,262,009.46	$33,612,335.20	$32,698,965.01	$34,200 286.06
Operating Expenses								
Wages	16,826,418.23	17,108,189.09	17,534,387.50	17,108,826.50	17,218,039.47	15,024,318.04	14,920,406.05	16.753.667.71
Material, supplies and other items	3,155,788.61	3,422,294.20	3,349,367.41	3,164.261.04	3,165,430.27	3,149,687.89	3,056,529.80	2,899,983.94
Injuries and Damages	1,191,690.87	1,200,313.79	760,440.65	649,131.12	789,098.53	700,740.79	476.844.02	627.629.02
Depreciation	2,814,526.88	2,970,707.64	2,533,773.15	2,496,000.00	2,250,000.00	2,004,000.00	2,004.000.00	2.004.000.00
Fuel	1.094,966.47	1,133,423.85	1,128,464.98	1,188,199.60	1.587,089,27	2,027,712.50	1,656,012.89	2,399,277.71
Total Operating Expenses	$25,083,391.06	$25,834,928.57	$25,306,433.69	$24,606,418.26	$25.009,657.54	$22,906.489.22	$22,113,783.76	$21,684,558.41
Taxes	1,793,128.48	1,902,525.06	1,819,905.37	1,623,666.39	1,603,269.38	1,722,707.95	1.610,096.47	1.306.736.39
Dividends (including rent of leased roads)	3,149.857.26	3,155,110.88	3,165,449.57	3,173,836.74	3,182,020.41	3,186,048.02	4,155,997.46	4,196,533.56
Subway and Tunnel Rents	2,269,198.82	2,218,137.21	2,214,613.95	2,189,966.39	2,060,337.09	2,025,263.33	1,974,141.07	1,947,963.20
Int. on B. E. Bonds and Notes	2,553.097.18	2,515,714.25	2,532,590.89	2,576,651.75	2,479,762.27	2,277,051.15	1,483,786.91	1,483,625.54
Miscellaneous Items	78,418.70	68,249.60	58,907.03	58,995.48	71,165.21	65,986.23	58.475.99	54,479.21
Total Cost of Service	$34,927,121.50	$35,694,665.57	$35,097,900.50	$34,229,535.01	$34,406,211.90	$32,183,545 90	$31,396,284.66	$33,673,896.31
Loss or Gain not including Profit and Loss Items	$82,811.78	**$76,599.51**	**$10,054.61**	**$31,284.10**	**$141,202.44**	$1,428,789.30	$1,302,683.35	$526,389.75
Profit and **Loss** Delayed Items	812,706.23	137,259.76	32,359.07	51,865.43	141,202.44	**314,231.48**	82.528.09	23.863.77
Total **Loss** or Gain including Profit and Loss Items	$895,518.01 *	$60,660.25	$22,304.46	$20,581.33	$00.00	$1,111,557.82	$1,385,211.41	$550.253.52

	1920	1919	1918	1917	1915	1910	Sept. 30, 1905	Sept. 39. 1900
Total Receipts	$32,671,515.53	$25,226,981.50	$19,480,022.08	$19,788,953.25	$17,886.549.64	$15,245,865.48	$12,741,569.30	$10,236.994.49
Operating Expenses								
Wages	16,381,206.58	13.554,684.15	9,147,757.25	9,033,868.40	7,709,373.86	5,910,757.73	....	....
Material, supplies and other items	3,321,671.70	4,096,537.98	2,680,423.77	1,951,176.39	1,922,622.52	2,376.033.78	....	....
Injuries and Damages	627,626.48	805,353.09	817,227.18	819,705.54	722,177.00	776,588.37	....	....
Depreciation	2.004,000.00	2,004,000.00	352,670.00	330.000.00	62,989.65	200,000.00	....	....
Fuel	1,996,717.21	1,901,596.75	1,381,957.20	947,412.50	870,820.30	822,497.54	....	....
Total Operating Expenses	$24.331,221,97	$22,362,171.97	$14,380,035.40	$13,082,162.83	$11,287.983.33	$10,085,877.42	$8,617,653.04	**$7,068.110.24
Taxes	1,075,496.70	941,611.50	905,032.96	984,070.55	1.069.189.27	1,213,089.37	1,047,333.72	825,993.01
Dividends (including rent of leased roads)	4,011,535.96	3,947,349.57	2,905,611.60	3,622,482.28	3,638.655.75	3,030,168.15	1,233.199.43	1,157,130.00
Subway and Tunnel Rents	1.591,323.98	1,491,999.54	991,551.30	995,093.45	825,496.17	559,469.14	228,540.63	211.145.67
Int. on B. E. Bonds and Notes	1,593.257.58	1,423,142.14	1,238,373.55	1,128,655.88	1,049.785.12	556,000.00	779,757.76	498,569.89
Miscellaneous Items	69,284.73	37,372.67	16,050.44	9,525.11	4,587.89			
Total Cost of Service	$32,672,120.92	$30,203,647.39	$20,436,655.25	$19,831,990.10	$17,875,697.53	$15,444,604.08	$11,906,484.58	$9,760,919.84
Loss or Gain not including Profit and Loss Items	**$605.39**	**$5,412,014.35**	....	....	....	....	....	....
Profit and **Loss** Delayed Items	17,685.34	3,485.78	....	....	....	....	....	....
Total **Loss** or Gain including Profit and Loss Items	$17,079.95	**$5,415,500.13**	**$956,633.17**	**$13,036.85**	$10,852.11	**$198,738.60**	$835,084.72	$176,014.65

† Not reported separately before 1919.

** Includes $240,000.00 to Depreciation Reserve.

* Includes $135,348.46 back pay applying to May and June, 1919, but paid in October, 1919.

RECEIPTS AND EXPENSES OF THE RAILWAY

Receipts Holding Up Well—Operating Costs Reduced—Substantial Sum Repaid to Cities and Towns.

The table on the opposite page shows that the receipts of the Railway for the fiscal year ended June 30, 1928, were under those of the preceding year by $608,132.78, or 1.71 per cent. This was more than offset, however, by the reduction in operating expenses, which decreased $751,537.51, or 2.91 per cent.

The saving in operating expenses was brought about mainly through reduction in expenditures for materials (7.79 per cent), the depreciation account (5.26 per cent) and fuel (3.39 per cent). The total cost of service, in spite of increases in several items, was $767,544.07 less than the preceding year, or 2.15 per cent. The largest saving outside of operating expense was in taxes (5.75 per cent).

It is of interest to note that, due to the profit-and-loss surplus shown, the trustees were able to pay to the State Treasurer the sum of $895,518.01 on account of the indebtedness of the Railway to the cities and towns which it serves. The largest credit was $400,000 profit from the Transit Mutual Insurance Company through which the Railway administers compensation insurance.

Thus the debt to the cities and towns was reduced to slightly less than $1,350,000. At its maximum the debt was nearly $4,000,000. Of the balance still owed by the Railway, Boston's share is $977,554; Cambridge's share is $131,931; Somerville's is $57,052, and the remainder is distributed among nine other cities and towns.

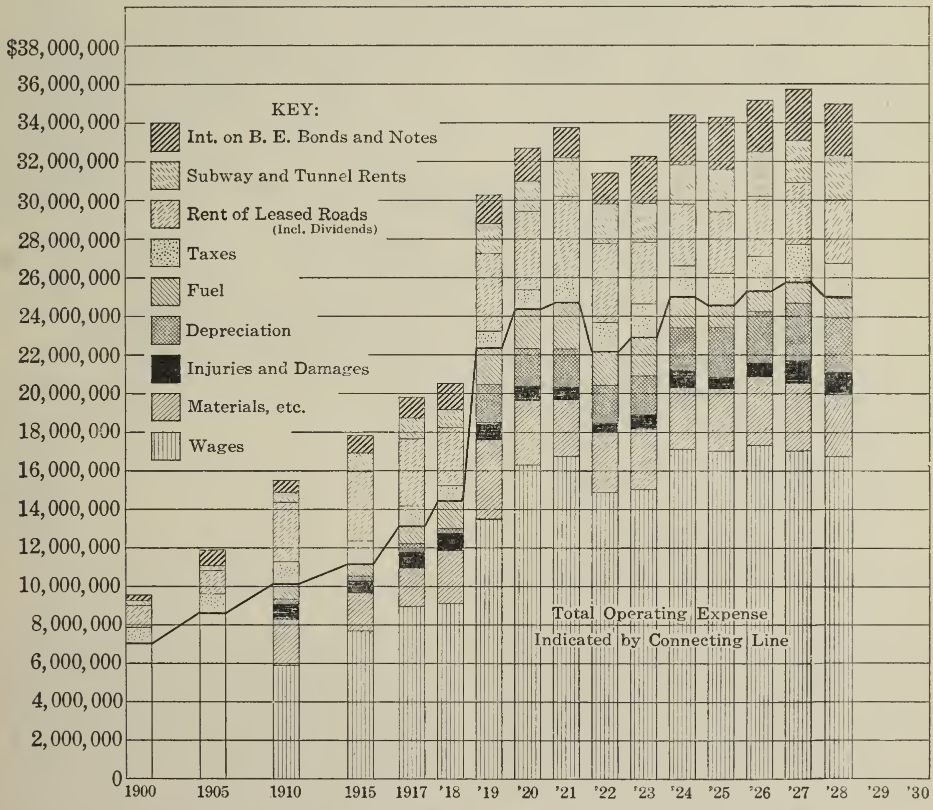
THE VISITING NURSE

The Visiting Nurse Service was established Jan. 1, 1924, for the purpose of assisting the employees of the Railway during illness—working in conjunction with the family physician.

Headquarters were established in the Bureau of Audit Offices, Park Square Building, where a room was provided with all modern facilities used in connection with first-aid work.

Those sustaining injury in the building or outside calling for the services of a nurse are treated in this room, and where necessary are referred to their family physician.

(Please turn to page 109)



GRAPHICAL STORY OF THE RAILWAY'S COST OF SERVICE

PROSECUTIONS FOR

As a Result of the Vigilance of the Rail
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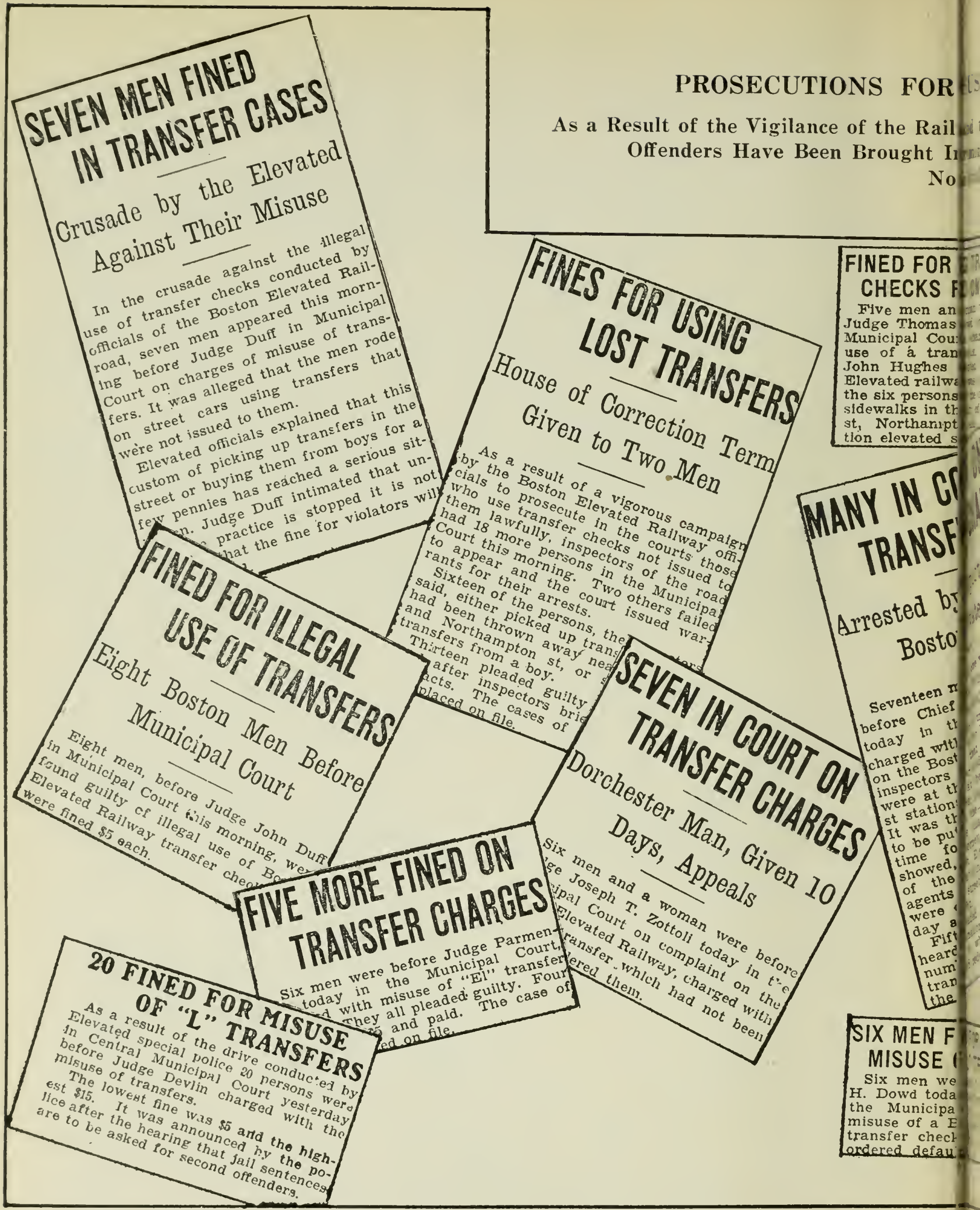

SEVEN MEN FINED IN TRANSFER CASES

Crusade by the Elevated Against Their Misuse

In the crusade against the illegal use of transfer checks conducted by officials of the Boston Elevated Railroad, seven men appeared this morning before Judge Duff in Municipal Court on charges of misuse of transfers. It was alleged that the men rode on street cars using transfers that were not issued to them.

Elevated officials explained that this custom of picking up transfers in the street or buying them from boys for a few pennies has reached a serious sit-
n. Judge Duff intimated that un-
practice is stopped it is not
hat the fine for violators wil

FINES FOR USING LOST TRANSFERS

House of Correction Term Given to Two Men

As a result of a vigorous campaign by the Boston Elevated Railway officials to prosecute in the courts those who use transfer checks not issued to them lawfully, inspectors of the road had 18 more persons in the Municipal Court this morning. Two others failed to appear and the court issued warrants for their arrests.

Sixteen of the persons, the
said, either picked up trans
had been thrown away nea
and Northampton st, or
transfers from a boy.
Thirteen pleaded guilty
after inspectors bri
acts. The cases of
placed on file.

FINED FOR ILLEGAL USE OF TRANSFERS

Eight Boston Men Before Municipal Court

Eight men, before Judge John Duff in Municipal Court this morning, were found guilty of illegal use of Bo
Elevated Railway transfer chec
were fined $5 each.

SEVEN IN COURT ON TRANSFER CHARGES

Dorchester Man, Given 10 Days, Appeals

Six men and a woman were before
ge Joseph T. Zottoli today in the
ipal Court on complaint on the
Elevated Railway, charged with
ransfer which had not been
ered them.

FIVE MORE FINED ON TRANSFER CHARGES

Six men were before Judge Parmenter
today in the Municipal Court,
d with misuse of "El" transfer
They all pleaded guilty. Four
5 and paid. The case of
ed on file.

20 FINED FOR MISUSE OF "L" TRANSFERS

As a result of the drive conducted by Elevated special police 20 persons were in Central Municipal Court yesterday before Judge Devlin charged with the misuse of transfers.

The lowest fine was $5 and the highest $15. It was announced by the police after the hearing that jail sentences are to be asked for second offenders.

FINED FOR
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Judge Thomas
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MANY IN C
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SIX MEN F
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DURING the past few years the Boston Elevated Railway has prosecuted many persons for frauds in connection with the use of transfer tickets. No person complained of was acquitted.

For the convenience of passengers, transfers are issued liberally all over the system. But some people fail to realize that the misuse of transfers is not merely a fraud on the Railway but is an imposition on the rest of the community who pay their fares. Some people seem to think that because a single fare is only 10 cents the obtaining of a ride for nothing through the fraudulent use of a transfer is a small matter. The fact is that the fraudulent use of even 1 per cent of these transfers is a serious matter with respect to the revenues, as nearly 70,000,000 are collected annually.

USE OF TRANSFERS

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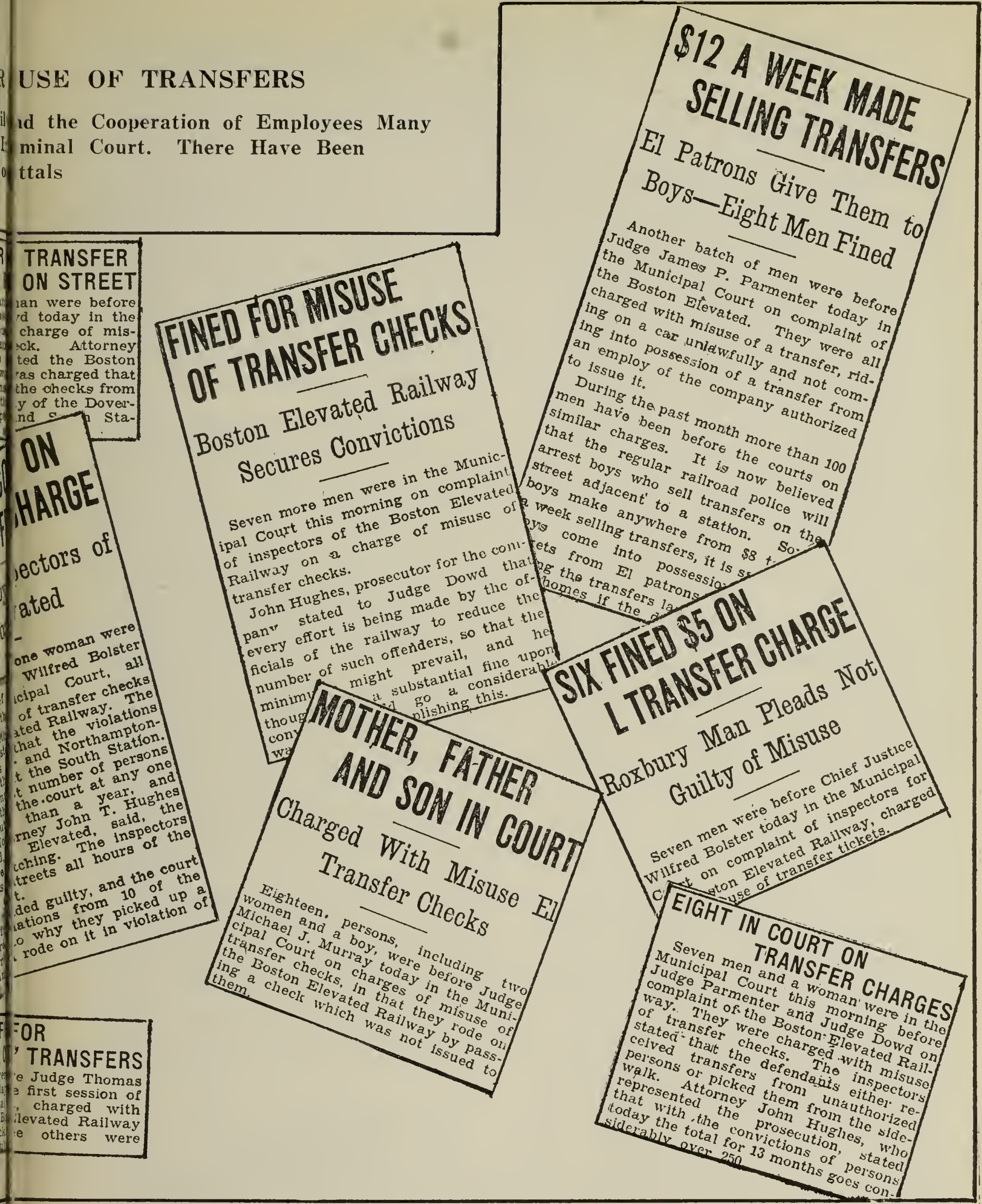

TRANSFER
ON STREET

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FINED FOR MISUSE OF TRANSFER CHECKS

Boston Elevated Railway Secures Convictions

Seven more men were in the Municipal Court this morning on complaint of inspectors of the Boston Elevated Railway on a charge of misusc of transfer checks.

John Hughes, prosecutor for the com-
panv stated to Judge Dowd that
every effort is being made by the of-
ficials of the railway to reduce the
number of such offenders, so that the
minimu ... might prevail, and he
thoug ... a substantial fine upon
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wa ... plishing this.

$12 A WEEK MADE SELLING TRANSFERS

El Patrons Give Them to Boys—Eight Men Fined

Another batch of men were before Judge James P. Parmenter today in the Municipal Court on complaint of the Boston Elevated. They were all charged with misuse of a transfer, riding on a car unlawfully and not coming into possession of a transfer from an employ of the company authorized to issue it.

During the past month more than 100
men have been before the courts on
similar charges. It is now believed
that the regular railroad police will
arrest boys who sell transfers on the
street adjacent to a station. So
boys make anywhere from $8 t
a week selling transfers, it is s
ys come into possessio
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g the transfers la
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MOTHER, FATHER AND SON IN COURT

Charged With Misuse El Transfer Checks

Eighteen, persons, including two women and a boy, were before Judge Michael J. Murray today in the Municipal Court on charges of misuse of transfer checks, in that they rode on the Boston Elevated Railway by passing a check which was not issued to them.

SIX FINED $5 ON L TRANSFER CHARGE

Roxbury Man Pleads Not Guilty of Misuse

Seven men were before Chief Justice
Wilfred Bolster today in the Municipal
Court on complaint of inspectors for
...ston Elevated Railway, charged
...use of transfer tickets.

EIGHT IN COURT ON TRANSFER CHARGES

Seven men and a woman were in the Municipal Court this morning before Judge Parmenter and Judge Dowd on complaint of the Boston Elevated Railway. They were charged with misuse of transfer checks. The inspectors stated that the defendants either received transfers from unauthorized persons or picked them from the sidewalk. Attorney John Hughes, who represented the prosecution, stated that with the convictions of persons today the total for 13 months goes considerably over 250.

FOR
TRANSFERS

ʼe Judge Thomas
e first session of
, charged with
levated Railway
e others were

The result of this attitude on the part of a number of patrons is that, on arriving at stations where transfers are issued for the sole purpose of enabling them to ride farther on other cars if they wish to do so, they take transfers even when they have finished their trip and have no use for the transfers themselves. These fall into the hands of unscrupulous people.

The main difficulty that confronts the Elevated in controlling this evil is that, to an individual, defrauding the Railway of a 10-cent fare seems a small matter. But to the Railway the loss of a large number of fares is serious. The seriousness of the offence is recognized by the law, which provides for a fine up to $50 or imprisonment up to thirty days for the misuse of transfer.

SELLING CAR RIDES

The Author Shows How the Principles of Salesmanship Can Be Applied in the Selling of Transportation Service. He Outlines Some Qualifications for Selling

By DWIGHT BURROUGHS

Superintendent, Personal and Publicity, United Railways & Electric Company, of Baltimore

WE—you and I—whoever we are, whatever positions we hold with this street railway, may be boosters of it, advertisers of it, salesmen and saleswomen of its business, increasing car riding and influencing public opinion in favor of the Railway.

This is not only an opportunity; it is a responsibility, and a responsibility no one of us can escape. In living up to it the biggest part we can play is to perform well the duties that are specially assigned us. But this must be supplemented in our contact with our fellow citizens by a living loyalty to this business, of which we should be a faithful part as well as a hardworking part.

NOW you, dear reader, exclaim: "How do you get that way? I'm a workman, or a mechanic, or a clerk, or a stenographer, or a conductor, or a motorman, or a foreman, or a departmental aide, or the head of a department, or the general manager, or a stockholder, and I perform my duties well. How can I be of any other use? I'm asking you as man to man; I'm asking you as a friend, and I'm curious to know your answer. Do you expect me to become an advertising man?"

And softly and calmly we reply:

"No, we don't expect you to become the advertising man; you ARE the advertising man or woman of this railway.

And as advertising men and women you are salesmen or saleswomen of the Railway and its business.

Whatever position I hold, and whatever the duties I perform, I am a very important part of the most powerful advertising and selling force that the street railway possesses. My especially big job is the proper and thorough performance of the tasks for which I am employed, and in properly and thoroughly performing those tasks I am advertising this railway as a good railway and worthy to be patronized.

If my duties call for the handling of passengers on a car, and I do this well, I am advertising well. If my duties call for cleaning cars and I do this well, I am advertising well. If my duties call for directing the destinies of the railway and I do this well, I am advertising well. So, whether I am a carman, or a car cleaner, or the general maanger, or an employee of any other grade, as I perform my tasks, so do I advertise the railway and make friends for it and make business for it.

So much for that, and now, how about our qualifications for salesmanship?

Qualifications for Salesmanship

IMPRESS this fact in great, big, letters upon your memory:

A salesman must have confidence in what he is selling.

I cannot be an effective salesman unless I have faith in the product of which I am trying to dispose. I must appreciate its usefulness and its value. If a salesman does not believe the article he is selling is good, he should be selling something else.

There is every reason why we should have confidence in the street car ride. If we are just a trifle weak in this respect, we should look within us and see if the trouble is not there instead of with the business.

Maybe it is a lack of knowledge.

How much—or how little—do we know of the business?

Let's review a few outstanding facts about this street railway industry. Probably they may quicken our confidence and give us a broader and more optimistic view of the railway industry in general and of our own street railway business in particular.

16,000,000,000 Customers

Nearly sixteen billion pasengers rode on the street railways of America last year. That looks as if the railways must have performed some service, doesn't it? That looks as if there was a market for the business, doesn't it? Here were sixteen billion passengers going from one point to another, all of whom either

You don't need a drum

had no other means of going between those points or who **preferred this means of transportation to any other.**

In Boston you hauled your proportion of this enormous multitude, for slightly more than one million revenue passengers rode on your cars every day in the year. This means that your street railway performed a great big necessary service, and that there is a live market in Boston for car-ride business.

There is no other agency on earth that could have rendered this service to the sixteen billion American passengers or the million a day home folks in Boston.

When you hear some one talk about "the passing of the street car," present him these figures and ask him to explain them.

Electric Railway Not a "Back Number"

A very complete study of the subject convinces one that the only thing true about "the passing of the street car" is the fact that they are always passing; twenty-four hours a day they are trundling through the streets and suburbs offering the most convenience of all means of transportation to the public, and the public is appreciatively accepting the offer—at the rate of sixteen billion a year in America.

When you hear someone say that the private automobile has displaced the street car remind him that the mayor's street and traffic survey of retail-store patrons, made under the direction of Dr. Miller McClintock, of the Erskine Bureau, Harvard University, on Nov. 4, 1927, showed that of 56,681 retail-store patrons 62 per cent used the subway, elevated and street cars, 23.7 per cent walked and 14.3 per cent used automobiles. Of 1,656,953 persons entering and leaving the inner cordon of downtown Boston on a typical week day (June 28, 1927), 47.2 per cent used the electric railway, 25.7 per cent used vehicles, 14.1 per cent walked, 11 per cent used steam railroads and the remaining 2 per cent used buses or boats, including the municipal ferry.

Constant Improvement

One very potent reason why street cars are remaining popular—and are going to continue to remain popular—is the fact that they are constantly offering improved service. Today they are more convenient, more comfortable and generally in every way more efficiently and more effectively serving their purpose than ever before.

This is due to the unceasing study being made of ways and means to improve the details of construction, and the details of operation, and the application of the new found means and methods. The business and all its branches have been reduced to an exact science, and the most thorough attention is given to the minutest details in efforts at improvement.

Trolley Breaks Reduced

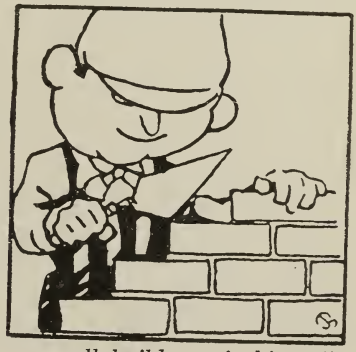
Let us give an illustration of this sort of thing that doesn't show up so prominently on the surface, but that is infinitely helpful to the car-riding public. Trolley-wire breaks were once the bane of the street-car man's existence, and everlastingly dreaded by the hurrying passenger. Breaks were regarded as natural evils and might be due to any one of a great many causes. So they were taken by the riding public as a matter of course, and expected—or feared—at frequent intervals. In the year 1918 there were 375 trolley-wire breaks on the lines of the Boston Elevated Railway. This figure was cut to 360 in 1919, to 313 in 1920, to 271 in 1921, to 261 in 1922, to 331 in 1923, to 265 in 1924, to 188 in 1925, to 217 in 1926, and to 144 in 1927. During the first six months of this year (1928) there were only fifty-six breaks.

This reduction, meaning the elimination of more than 250 breaks per annum, if the present rate is maintained, was achieved only through the closest sort of inspection work, which detected weak lines and repaired or replaced them before they got to the breaking point.

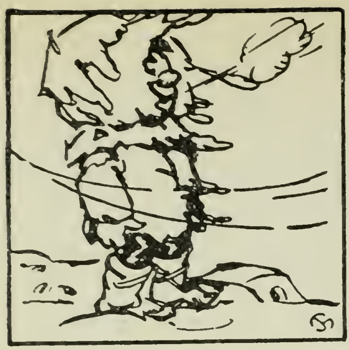
It is but an instance of many that might be cited to show increased efficiency in detail work that keeps the street railway in the forefront of developed sciences.

Always Everywhere

There are some other facts that every employee of a street railway should possess. If you spread before you a map of the city and suburbs you will see that the cars serve every section. They go everywhere. They reach nearly every point. You will notice especially that they traverse those lanes upon which there is the greatest demand for service. They were built for that purpose—to render the greatest service to the greatest number of persons; and they do it.



We are all builders of this railway



An icy personality does not attract friends

If that is a map of Boston you have before you, it shows there are nearly five hundred miles of electric railway tracks, over which cars are running for public convenience today. At practically every point at which car lines intersect free transfers are provided from line to line —hundreds of millions of such transfers being made each year. The cars run through the night as well as by day. Unless some mishap has occurred, there is never a lengthy wait for a car. Running schedules are made to fit the passenger demands on each line at different times of the day and night and, in view of the multitude of obstacles imposed by city traffic, it is remarkable how closely the cars adhere to schedules.

The mishaps that result in delays are nine times in ten due to causes out of the control of the Elevated Railway. For instance, auto vehicles and others stalled or broken down in tracks; trucks unloading; fires; steam railroad blocking crossings; congestion of autos in city's busiest streets, etc.

ELEVATED CLOSE-UPS

The Rapid Transit Lines Porter

(See Illustration on Front Cover)

AT elevated, subway and tunnel stations who is the man that sweeps and cleans the long platforms, numerous stairways, and countless nooks and corners? It is the station porter.

Each porter, when assigned to a station, is provided with necessary working tools and supplies, and is required to keep his station in a clean, safe and sanitary condition, working under the immediate direction of the inspector or starter in charge.

His work consists of general sweeping of platforms, stairs and pits; washing walls, windows, toilets, floors and "white lines"; dusting booths, handrails, turnstiles, lamps and signs and picking up papers, litter and other rubbish.

Wet sawdust must be used when sweeping to avoid raising dust. Dry sawdust to absorb dampness must be sprinkled around in wet weather to keep platforms and stairways as dry as the weather conditions will permit. In cold, snowy weather sand is used wherever necessary to prevent slipping.

During snow storms the porter is busy with the removal of snow and ice, and must remain on duty as long as weather conditions require.

The porter, when on duty, is neatly attired in a brown khaki uniform and goes about his work at such times and in such a way as to inconvenience the patrons the least. Like all other employees he is required to be courteous, considerate and helpful to passengers at all times and under all circumstances.

The night porter is also night watchman of the station, and must be particularly alert when stations are closed and no other official is on duty to guard the railway property against fire, robbery, or intrusion by unauthorized persons. In case of any unusual happening he must notify the train dispatcher by telephone at once.

In case of any accident on stairs or platform, porters are required to make out an accident report, stating particularly when the place of accident was last cleaned, when examined before and after the accident, condition in which it was found, and such other information as may be essential.

At the present time the force of porters consists of ninety men, eight of whom are head porters.

THE WHEELS OF TIME

By Henry V. Neal, Albany Street Shops

The wheels of time ever roll one way,
And never turn back a single day;
'Tis on and on, be it day or night,
We never escape time's onward flight.
We catch the moments that make the years,
And fill them in with our smiles or tears.
Tho' the heart is sad or bright and gay,
The wheels of time ever roll one way.

Then scatter your smiles, the balm for pain;
We never shall pass this way again.
Whatever we do, whatever we say,
The wheels of time ever roll one way.

The wheels of time ever roll one way;
For prince or peasant they'll never stay.
Regrets of the bygone years are vain,
They never come rolling back again.
The buds we bear in our youthful prime
Will bear the harvest of autumn time.
In life's best prime or when locks are gray,
The wheels of time ever roll one way.

PENSION LIST LENGTHENS

Seventy-five Names Added in 1928 to Date—Net Increase in Same Period Is Forty-six—Twenty-eight Have Died

IN the issue of "Co-operation" for November, 1927, the list of pensioners was brought up to Nov. 15, on which date there were 396 names on the roll. The pension committee has since approved the following additions to the list:

January, 1928

H. W. Barnes, conductor.
G. R. Cassidy, conductor.
John J. Finn, warder.
Charles T. Gallagher, motorman.
Morgan Hooley, foreman maintenance department.
Edward Hynes, cableman.
Thomas F. Magner, gateman.
William Maitland, motorman.
H. V. Neal, machinist.
H. F. Page, conductor.
A. C. Parsons, machinist.
C. L. Pettee, motorman.
Henry Prentice, motorman.
George A. Welch, operator.
Thomas P. Welch, machinist specialist.
S. B. Wentworth, cableman.

February, 1928

Charles E. Arkell, motorman.
William A. Buckley, gateman.
W. H. Cummings, operator.
Gilbert Doucet, station receiver.
Daniel J. Downing, operator.
George M. Howatson, gateman.
Nelson Jamison, porter.
John Kenny, teamster.
Patrick Martin, track repairman.
Thomas F. McKenna, operator.
William Neville, machinist helper.
Patrick J. O'Connor, gateman.
Howard Pike, starter.
John J. Powers, mechanic.
Nicholas Sheehan, track cleaner.
James Sullivan, operator.
John M. Wolfe, motorman.
Thomas J. Gregory, operator.

March, 1928

Patrick Madden, warder.

April, 1928

F. L. Richardson, gateman.
George Brooks, warder.
T. O. Chapman, motorman.
M. J. Clarke, conductor.
S. W. Clarke, operator.
Joseph C. Curran, sub-foreman.
Benjamin Dayton, foreman.
James H. Huff, motorman.
M. J. Long, motorman.
D. C. McPherson, blacksmith.
John Scanlon, motorman.
Angus Smith, Carpenter.
William Doogan, machinist specialist.
M. W. Kelly, motorman.
G. O. Scott, motorman.

May, 1928

George C. Howard, conductor.
James F. Bradley, car cleaner.
William F. Dolan, conductor.
John Doyle, motorman.
Thomas F. Manning, cash counter.
John McDonald, service car motorman.
Frank A. Rankin, motorman.
James W. Stewart, motorman.
Orin E. Tebbetts, conductor.
James O. Webster, motorman.
Edward P. Whalen, motorman.
Mrs. L. E. Gerrish, collector.

July, 1928

Henry C. Burnham, motorman.
Thomas Cameron, blacksmith's helper.
John J. Carleton, repairman.
John Conway, conductor.
Eugene Dow, conductor.
James Grant, carpenter.
Edward W. J. Johnson, conductor.
Daniel E. McKay, carpenter.
Geoffrey J. Murphy, paver.
Michael Murphy, blacksmith's helper.
Edwin D. Pick, operator.
Michael Shaughnessy, motorman.
Howard Warder, motorman.

During the eight months there have been added thus to the pension list a total of seventy-five names. In the same period twenty-eight pensioners have died, as below, and one other has been removed from the list. The net increase is, therefore, forty-six pensioners, bringing the grand total to 442.

Pensioners Who Have Died

Since the last list was published, these twenty-eight pensioners have died:

November, 1927

H. A. Durgin, station receiver.
E. P. Coughlin, station receiver.
James McMahon, toolwagonman.

December, 1927

Mark Lydon, blackmith's helper.
Daniel O'Keefe, gateman.
Frank H. Cleveland, motorman.

January, 1928

John G. McLeod, motorman.
John McManus, motorman.
Patrick Kane, laborer.
John McGann, car cleaner.
Nathaniel Munroe, collector.
Joseph A. Seifried, motorman.

February, 1928

John F. Marr, warder.
C. E. W. Emery, conductor.
Charles McCuen, motorman.

March, 1928

Patrick Carney, gateman.
T. J. Purslow, special officer.
F. E. Patterson, carhouse repairman.
J. R. McGillivary, machinist.

April, 1928

H. J. Griffin, car cleaner.
Henry Young, motorman.
Ernest Pelton, Motorman.

May, 1928

Charles A. Swan, warder.
James C. McKenzie, gateman.
John Donovan, repairman.

June, 1928

Benjamin Dayton, foreman.
Daniel J. Downing, operator.

July, 1928

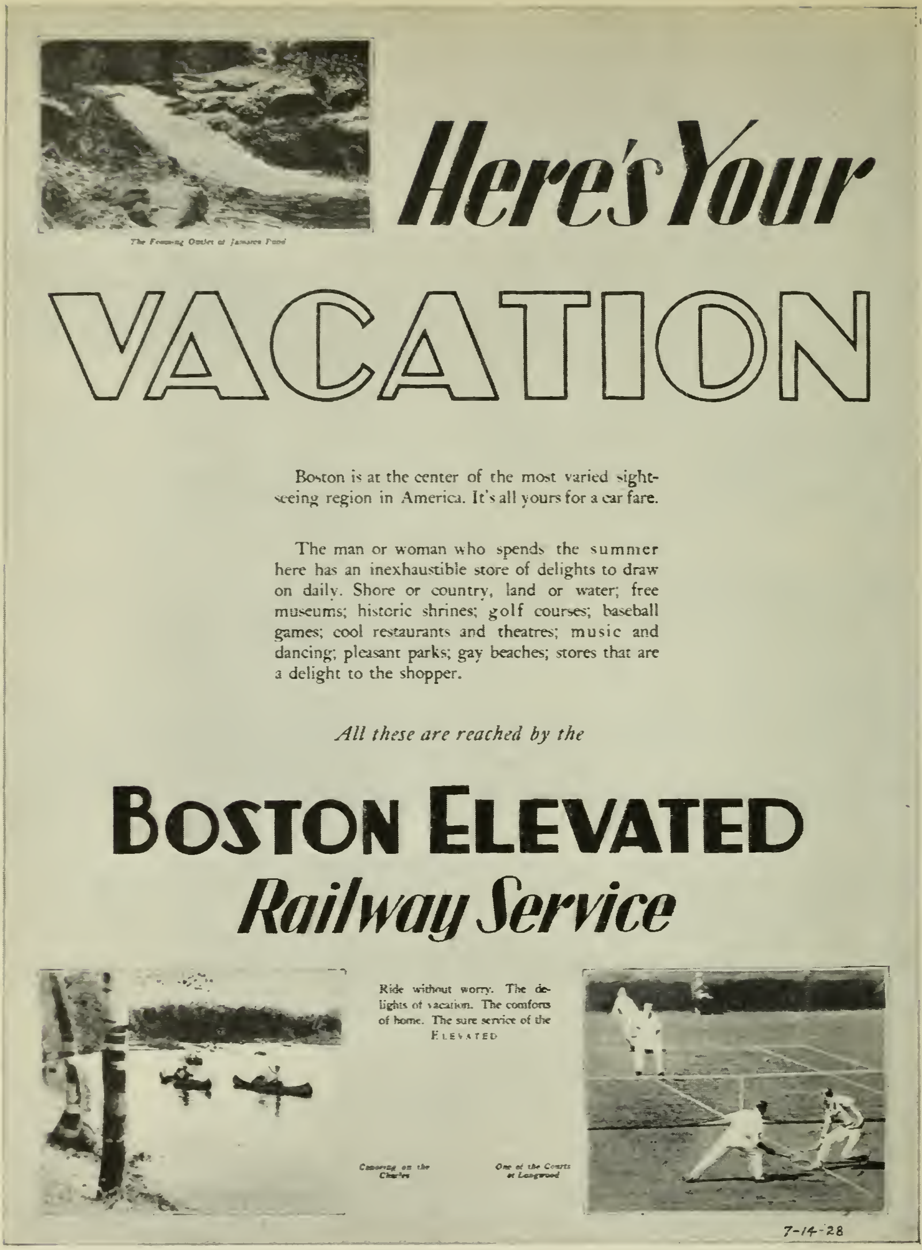
Leopold Kirchgassner, woodworker.

VISITING NURSE

(Concluded from page 103)

Employees in the building reported by the head of the department as being detained at home through illness are visited by the nurse and if necessary they are advised to consult with their family physician for treatment or advice.

During the last four years a yearly average of 321 first calls were made at the homes of those who were detained at home through sickness and a yearly average of 304 subsequent visits were made. Miss Estelle M. Maloney, R.N., has been in charge of this station since its establishment.



The Foaming Outlet of Jamaica Pond

Here's Your

VACATION

Boston is at the center of the most varied sight-seeing region in America. It's all yours for a car fare.

The man or woman who spends the summer here has an inexhaustible store of delights to draw on daily. Shore or country, land or water; free museums; historic shrines; golf courses; baseball games; cool restaurants and theatres; music and dancing; pleasant parks; gay beaches; stores that are a delight to the shopper.

All these are reached by the

BOSTON ELEVATED

Railway Service

Ride without worry. The delights of vacation. The comforts of home. The sure service of the ELEVATED

Canoeing on the Charles

One of the Courts at Longwood

7-14-28

A TYPICAL 1928 FULL-PAGE NEWSPAPER ADVERTISEMENT

This summer, as last, the Railway has been running a series of advertisements designed, in part, to bring to the attention of the community a number of beauty and comfort spots which can be reached by the Elevated lines.

The advertisement shown above appeared in rotogravure.

As soon as possible after the advertisements appear they are posted on the bulletin boards of the system, on a reduced scale, so that employees may be familiar with them and in a position, therefore, to cooperate with the management in stimulating summer traffic.

"EL" BUSES TRANSPORT SOLDIERS

On Saturday, July 7, under perfect weather conditions, the Railway's buses carried approximately 1500 men to Camp Devens for their summer encampment.

Forty-nine buses, each containing approximately twenty-nine men with their equipment, were mobilized in five groups for this purpose. Four buses started from Lynn; six buses from Medford, Everett and Stoneham; eight buses from Charlestown and Somerville; fourteen buses from Cambridge and Commonwealth Armories, and seventeen buses from East Newton and Irvington Street Armories.

Three repair trucks accompanied the buses as an insurance against emergency, and each group was guarded by constabulary officers on motorcycles, who rendered valuable service in clearing the road of traffic so that the buses could proceed at a speed of about 20 miles an hour.

The Railway furnished nearly one-half of all buses engaged in this group movement.

FIRST BUREAU OF AUDIT OUTING

On July 14 the bureau of audit staff held a highly successful picnic at Fieldston on the Atlantic, Marshfield, with 114 employees and members of their families in attendance. The party left the Park Square Building at 10 A. M. in private automobiles belonging to its members.

After luncheon a baseball game was played between two teams of girls, one from the revenue department, the other from other departments. This was followed by field sports, such as a tug-of-war, 35-yard dash, potato race, three-legged race, etc. Dinner was served at 5 o'clock and with it were various entertainment features by local talent. Dancing closed the program and the outing broke up informally at 7.30 P. M.

The expectation of those in attendance was that this first outing will be followed by many more.

AMELIA'S FRIENDSHIP FLIGHT

By Margaret L. Maccoy, Receiving Cashier's Office

O'er the Atlantic, far, far away,
Amelia and companions went their way;
Without a fear of the deep blue sea,
The Friendship flew like a bumblebee.

The men were anxious, Amelia, too,
Still they never lost hope, but flew and flew.
It took great courage for a flight like that.
To the girl Amelia we take off our hat.

We can't forget the men, that's true,
For Stultz was the pilot who brought her through.
Without a word of fear or fright,
They flew straight ahead through the darkest night.

Amelia prayed, as most women do,
And she knew her dear mother was praying, too.
They watched and stared with all their eyes,
Until Lou Gordon shouted to their surprise.

"I see the land as sure as fate!
God has spared the gas and we're not too late!"

OUTING

By D. H. Willett, Department of Accounts

Come where the clear brooks are running,
Down through the wood and the dale;
Come, hear the partridge drumming
Or the sweet call of "Bob White," the quail.

Come out, see the golden sun setting,
Watch it fade o'er the hilltops from view;
Come out, leave your worry and fretting,
See the picture on the clouds there for you.

Come at twilight, when the air it seems scented
With the perfume of newly mown hay;
Come out, feel your heart grow contented,
Come out, take the "El," come today.

HOW CAN WE IMPROVE THE SERVICE?

Suggestions by employees for improvement of service are always appreciated.

Write the general manager whenever you have an idea which, after careful thought and consideration from every angle, you believe would be helpful and he will give it his personal consideration.

CHANGES IN THE RESERVE FUND

Fiscal Year 1926-27

July 1, 1926, $1,000,000

July	$393,028.41*	Jan.	$186,947.50†
Aug.	451,546.79*	Feb.	92,018.37†
Sept.	236,543.80*	Mar.	256,586.83†
Oct.	2,723.19†	April	181,694.29†
Nov.	29,302.22†	May	113,284.72†
Dec.	234,879.91†	June	92,917.54*

Profit and loss credit. . . .$137,259.76

†Excess of revenue over cost of service.

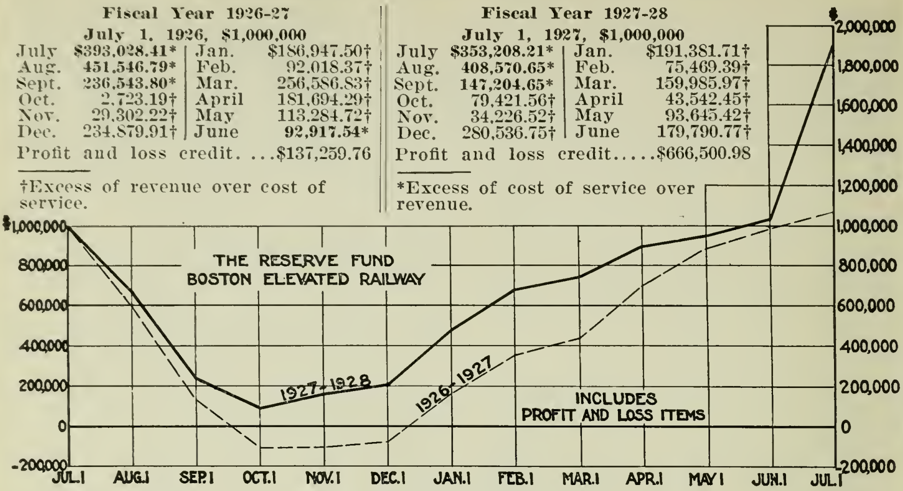
Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*	Jan.	$191,381.71†
Aug.	408,570.65*	Feb.	75,469.39†
Sept.	147,204.65*	Mar.	159,985.97†
Oct.	79,421.56†	April	43,542.45†
Nov.	34,226.52†	May	93,645.42†
Dec.	280,536.75†	June	179,790.77†

Profit and loss credit. $666,500.98

*Excess of cost of service over revenue.



JUNE OPERATION

	1928	1927
GENERAL FINANCIAL DATA		
Revenue exceeded cost of service	$179,790.77	
Cost of service exceeded revenue		$92,917.54
Operating revenue per car-hour (A.E.R.A. std.)	$6.14	$6.08
Operating revenue per car-mile operated	60.91c	61.81c
Average fare per revenue passenger	9.324c	9.271c
Ratio operating expense to operating revenue	72.09%	74.24%
PASSENGERS CARRIED		
Revenue passengers	29,055,924	29,167,572
Per cent 5c, 6c and 6¼c passengers	17.53%	17.75%
Revenue passengers per car-mile operated	6.336	6.466
OPERATING FACTS		
Trips operated	587,273	582,933
Car-miles operated:		
Rapid-transit lines	1,263,388	1,143,120
Surface, two-man	1,554,333	1,661,246
Surface, one-man	1,296,643	1,242,905
Express, newspaper and sprinkler cars	907	1,028
Motor bus	470,513	463,927
Total miles operated	4,585,784	4,512,226
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.97*	2.01*
Accidents per 10,000 bus-miles	1.742*	2.48*
Revenue passengers carried per accident	18,100	18,120
Average number of witnesses per accident	3.41	3.49
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	15	8
Employees complained of by car riders	95	75
Car defects reported per 10,000 car-miles	3.4	3.5
INFORMATION ABOUT POWER		
D. c. kw.-hr. output gross for month	16,459,865	15,963,240
Maximum kw. load	59,030	56,600
Tons of coal consumed for power	13,504	13,947
Lbs. of coal for power per d.c. kw.-hr. at cars	1.842	1.963
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	1.088c	1.180c
Per revenue car-mile	3.92c	4.21c
Kw.-hr. per revenue car-mile	3.608	3.566

*Does not include miscellaneous accidents or derailments.

July 19, 1928 81 EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY CO-OPERATION

Volume 7 AUGUST, 1928 Number 8

Boston Elevated Close-Ups

THE CABLE TESTING CREW
(See Page 121)

To All 'El' Employees

YOU have noticed in the newspapers several advertisements of the Railway designed to stimulate use of the system during the season of light riding, particularly the summer.

Reproductions of these on a smaller scale are being posted on bulletin boards for the information of all employees.

Every employee can help in this campaign by:

1. Familiarizing himself with the advertisements.
2. Backing up the advertisements by explaining the summer situation to neighbors and friends.
3. Doing his best to improve the service as explained on this page in the June issue of "Co-operation."

Last summer the same procedure as this was followed regarding advertising and posters. The result was satisfactory. The usual summer slump was partly prevented. Our traffic held up much better than that of neighboring railways.

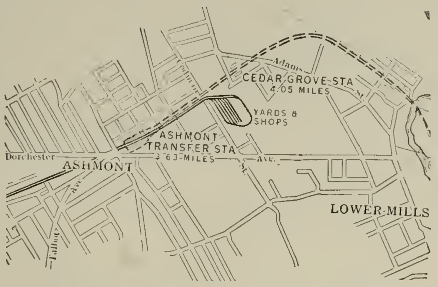
YOUR CO-OPERATION HELPED TO ACHIEVE THESE RESULTS.

Let's do even better this year.

Edward Dana

RAPID TRANSIT EXTENDED TO ASHMONT

New Terminal Has Capacity as Great as That of Park Street Station—Serves as Transfer Station for Rapid Transit, Surface-Car and Bus Lines—Will Ultimately Accommodate High-Speed Trolley to Mattapan



Ashmont Station and Surroundings

SEPTEMBER 1 will mark an important stage in the development of rapid transit in Boston, for on that day the extension of the Dorchester tunnel service to Ashmont transfer station will be completed. Ashmont is 1.23 miles from Fields Corner, to which the service was extended on Nov. 5, 1927. It is 3.63 miles from Andrew station.

The extension from Fields Corner to Ashmont differs somewhat in construction from the section north of Fields Corner, for from Park street to Peabody square the rapid-transit tracks will be covered. This section will have the appearance of a subway, except that it does not go under buildings. The roof of the covered section is visible for its entire length of 4,042 feet. This covered section extends to the north end of the Ashmont terminal station.

As will be noted in the accompanying map, the rapid-transit tracks extend beyond the Ashmont terminal to Codman street, or the Southern artery. There are three tracks between the terminal and the Southern artery, one of which will be used as a relay track.

Just south of the Southern artery is a yard, occupying approximately 481,000 square feet of land, in which are a loop track and seven straight tracks. The latter will accommodate sixty Cambridge subway type cars, while the loop track has capacity for thirty more.

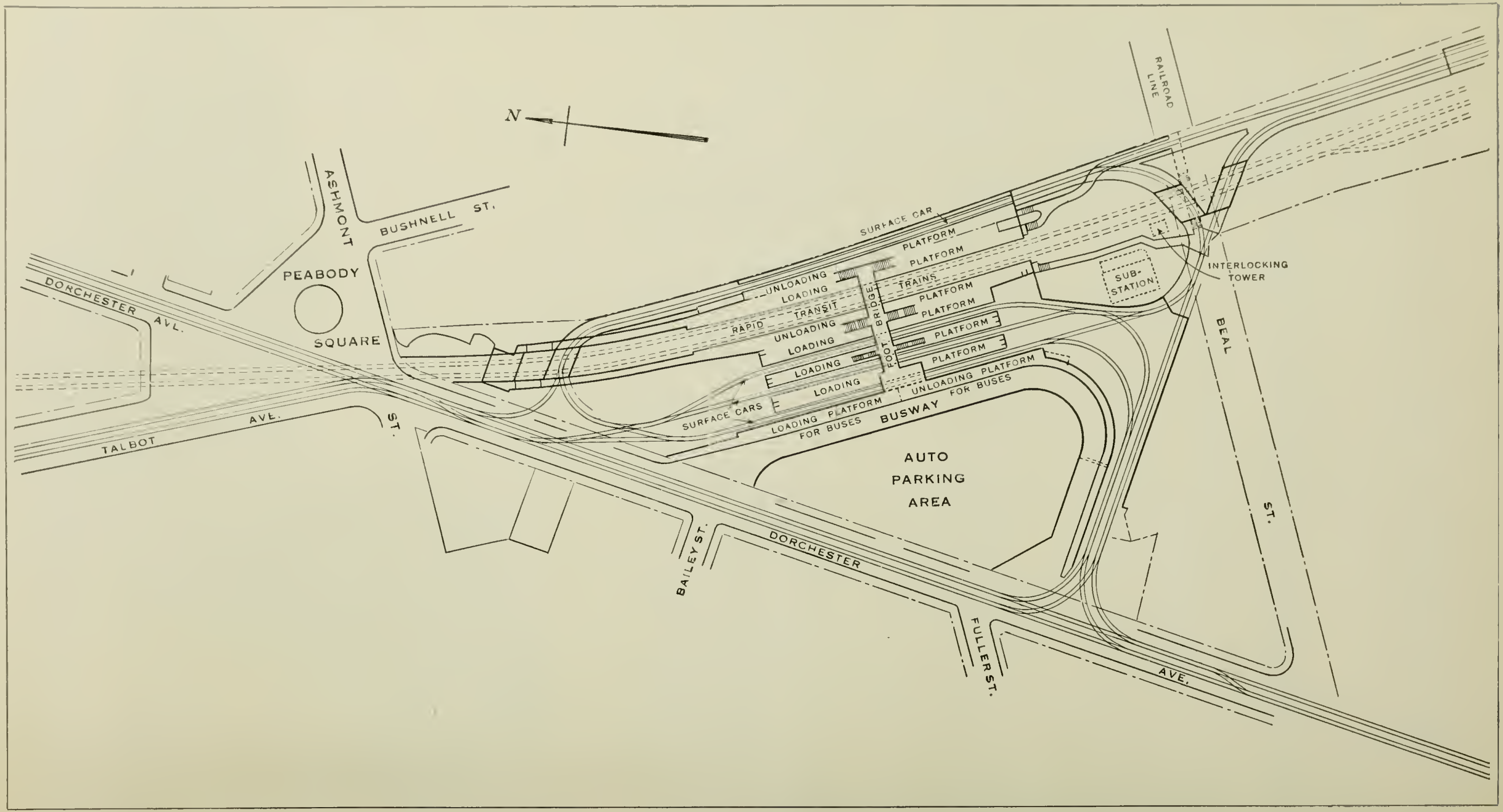
At the entrance to the yard is a brick building, 65 feet 8 inches by 26 feet 2 inches in size and one story high. This will be used to house tools and to accommodate men stationed in the yard from the three departments, transportation, rolling-stock and shops, and maintenance.

The Ashmont Terminal

The terminal station occupies a triangular piece of land, 198,000 square feet in area, bounded by Dorchester avenue, Beale street and private property on the west side of Bushnell street. The rapid-transit terminal, located in this area, comprises inbound and outbound tracks with facilities for transfer of passengers from surface cars and buses. An inbound platform 32 feet in width is located between the in-town rapid-transit track and the unloading track for sur-

(Please turn to page 120 after examining illustrations on next four pages)

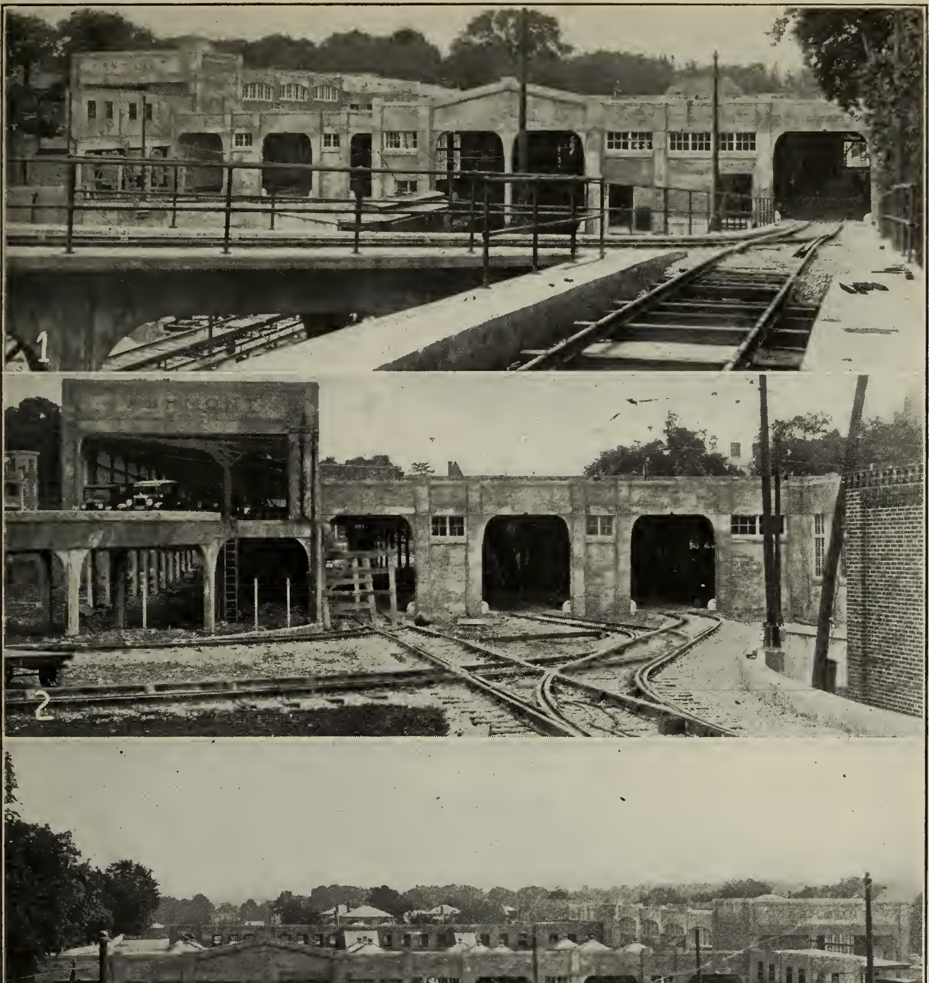
ASHMONT STATION HEADHOUSE HARMONIZES WITH RESIDENCES



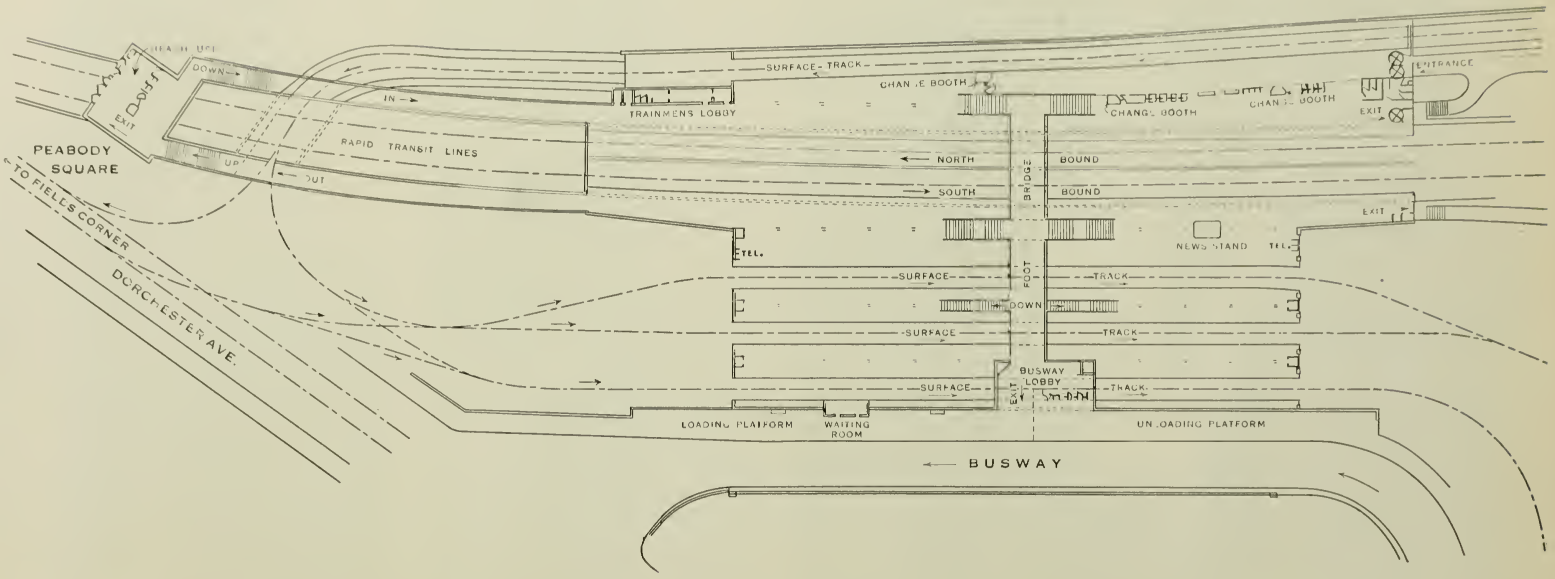
GENERAL LAYOUT OF ASHMONT STATION PROPERTY

Note location of substation, to be described in a later issue, and automobile parking area.

(See page 118 for station details.)

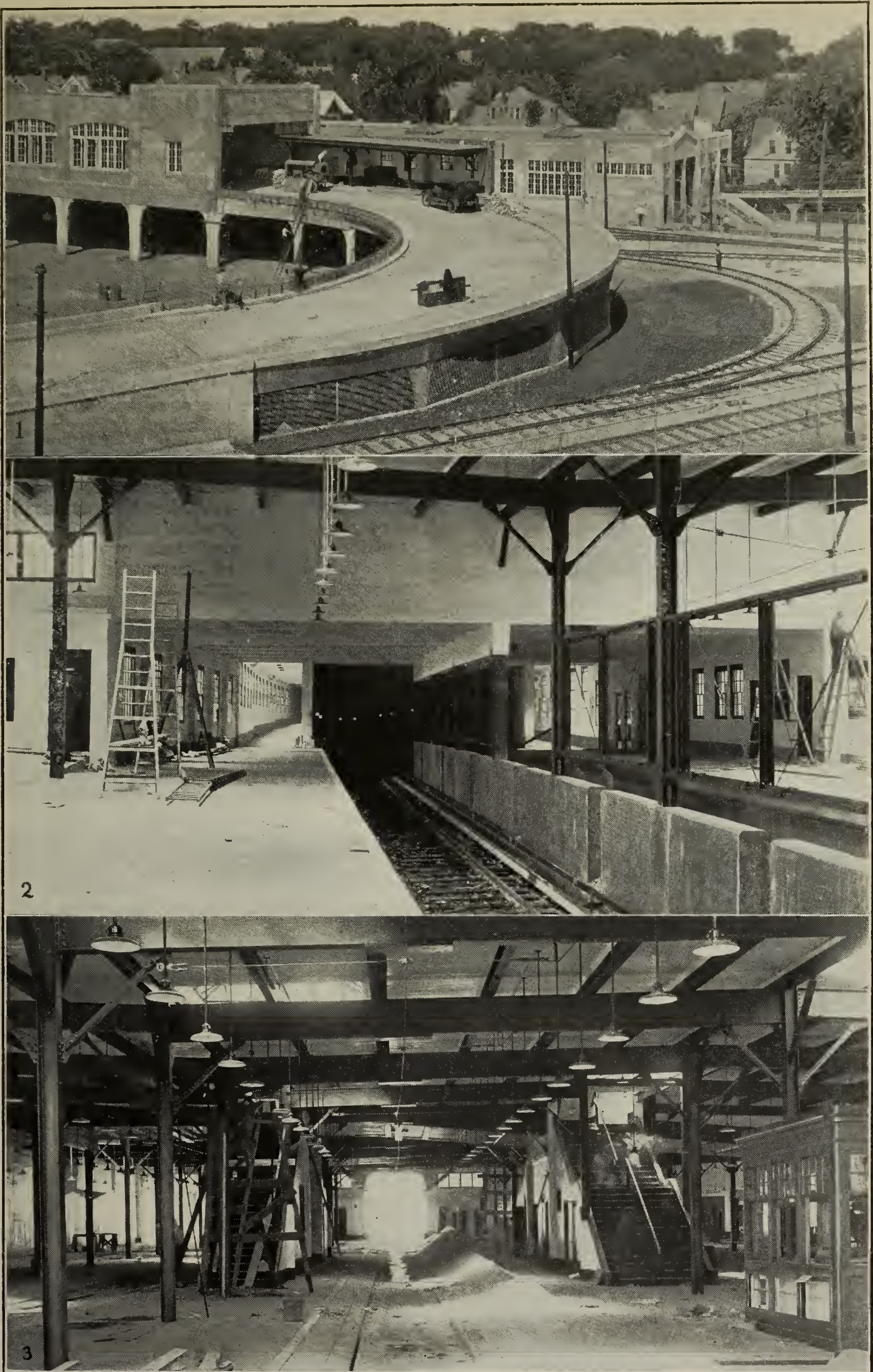


PRE-OPENING VIEWS AT ASHMONT STATION
1, south end, showing high-speed trolley entrance at right, busway at left. 2, south end, showing elevated busway at left, trolley tracks at right and corner of substation at extreme left. 3, north end, showing trolley tracks at right and roof over rapid-transit tracks at left. 4, busway from north.



DETAILS OF ASHMONT STATION

The accompanying reproductions of photographs show the station from a number of points of view. To get the best possible mental picture of this development the photographs should be studied in connection with the above plan.



PRE-OPENING VIEWS AT ASHMONT STATION
1, the graceful sweep of the busway looking toward bus entrance to station. 2, southbound rapid-transit platform, looking toward headhouse at Peabody Square. 3, looking north along surface track toward Dorchester Avenue.

(Continued from page 115)

face cars. On the other side of the station, next to the outbound rapid-transit track, is a 31-foot platform having an area of 9,475 square feet. Parallel to this are three surface tracks at the same level.

The rapid-transit platforms are sufficiently long for 4-car trains, but can be extended to accommodate 6-car trains. The trolley-car unloading track can also be extended when the platforms are extended. The platform for in-town passengers is divided into pay-leave and pay-enter sections. Surface cars operating between Dudley street and Ashmont, by way of Washington street and Talbot avenue, and by way of Blue Hill avenue and Talbot avenue, will discharge passengers at the northerly end of the station in the "paid area," because such passengers have previously paid their fares. Surface cars operating between Milton and Fields Corner will discharge their passengers at the southerly end of the station in the "unpaid area." At the latter end of the station passengers will pass through a barrier in which are ten fare-collecting devices.

Entrance to the station is provided through a pleasingly designed building on the street level at Peabody square. From this building, by means of stairways and passageways at the sides of the rapid-transit tracks, the passengers may enter or leave any portion of the station. Entrance is also provided at a high level off the bus area.

Buses enter the station at the south, ascending a driveway 22 feet wide and having a grade of 4 per cent. They reach a driveway 14 feet wide and 330 feet long. This is divided in the center into an unloading section at the south end, accommodating five buses, and a loading portion at the north end, accommodating six buses.

Persons leaving the buses pass through fare-collecting devices to the bridge which runs across the station at a high level. On either side of the bridge stairways lead to each of the platforms.

The stairways leading to the rapid-transit platform are 8 feet wide and those leading to the surface-car platform are 4 feet wide.

Provision is also made at the north end of the station for passengers entering from Radford lane, and an exit is provided from the south end of the rapid-transit platform to Beale street. In addition, a sub-passageway has been constructed under the tracks, connecting Beale street with Radford lane, so that persons living on the east side of the rapid-transit lines may reach the station without being obliged to go to Peabody square, or to take an even longer route, and persons leaving the station can reach their homes by means of the sub-passageway.

Trolley cars will enter the station from Dorchester avenue at the south end, going around the overhead loop, and will unload on the platform adjacent to the inbound rapid-transit track. These cars may proceed either directly to Dorchester avenue, and thence to points north, or they may take the overhead loop at the north end of the station on any one of the three tracks provided and leave the station at the south end, proceeding to Dorchester avenue in either direction.

In the station there are 730 feet of rapid-transit track and 3,760 feet of surface-line track. The total platform areas are: rapid-transit, 11,285 square feet, and surface-line, 15,015 square feet.

Others Items of Interest

In the triangular area between the station and Dorchester avenue provision will be made for parking automobiles. The area will accommodate 142 cars. An entrance has been provided directly from the parking area by means of a stairway leading up to the north end of

FIRST OUTING OF BOSTON ELEVA
(See issue of "Co-operation

the bus unloading platform. An exit leads directly from the station into the parking area through the west wall at about the center.

The terminal is of size sufficient to accommodate traffic equal to that handled in the Park street station in the Tremont street subway, and it is anticipated that the movement of surface cars and buses will equal in number the car movements at Park street.

The station is designed to provide for the future as well as the present. In the design, special attention was given to the layout so that the tracks for cars and roadways for buses entering and leaving the station would be easy and convenient for operation.

The station, particularly at the Peabody square end, has been made as pleasing as possible by providing a handsome entrance building, with lawns in front. The side of the station facing towards Dorchester avenue will be further beautified with shrubbery.

It will be remembered that this station will also be the terminal for a high-speed trolley line which will operate to Mattapan square. This has not been completed as yet.

ELEVATED CLOSE-UPS

The Cable Testing Crew

(See Illustration on Front Cover)

WHEN the electric railway industry was in its infancy, power was carried from the generator at the power station to the trolley wire through feed wires strung on poles. More recently, municipal ordinances, compelling the removal of the feed wires from the poles and the installation of cables in underground conduit, have practically cleared the large municipalities of overhead feed wires.

On the Boston Elevated system, about 350 miles of underground cables are required to carry direct current power at 600 volts to the trolley wire and third rail.

These cables may be compared to the wires of the ignition system on an automobile. When a short-circuit occurs on the wires of the automobile, it generally stops. This is true to a degree with the street cars when a short-circuit occurs on a distribution cable on the Railway's system. A short-circuit on a distribution cable means that the insulating material between the copper wire carrying the electrical current and the lead sheath has broken down.

To guard against such failures, a staff of trained men is employed in the electrical engineering division of the department of power to make periodic tests on the underground cables. The "close-up" on the front cover shows how the cables are tested with a portable testing set in the street. A stationary set of a similar nature is employed for some testing and for testing cables on reels on which they are received.

The test men shown in the "close-up" are familiar with the entire underground system. When a cable burnout does occur, at any time day or night, they are immediately called. Due to their familiarity with the system they can clear the trouble, locate the fault and have repairs made as quickly as possible.

When a faulty length of cable is removed from between two manholes in the street, it is not necessarily a length to be scrapped. It is overhauled under direction of test men and as much of it as tests "good" and is of reasonable length becomes stock for further use.

(Please turn to Page 126)

RAILWAY BUREAU OF AUDIT STAFF
r July, page 111, for details)

AUTOMOBILES AND FARES AFFECT RIDING HABIT

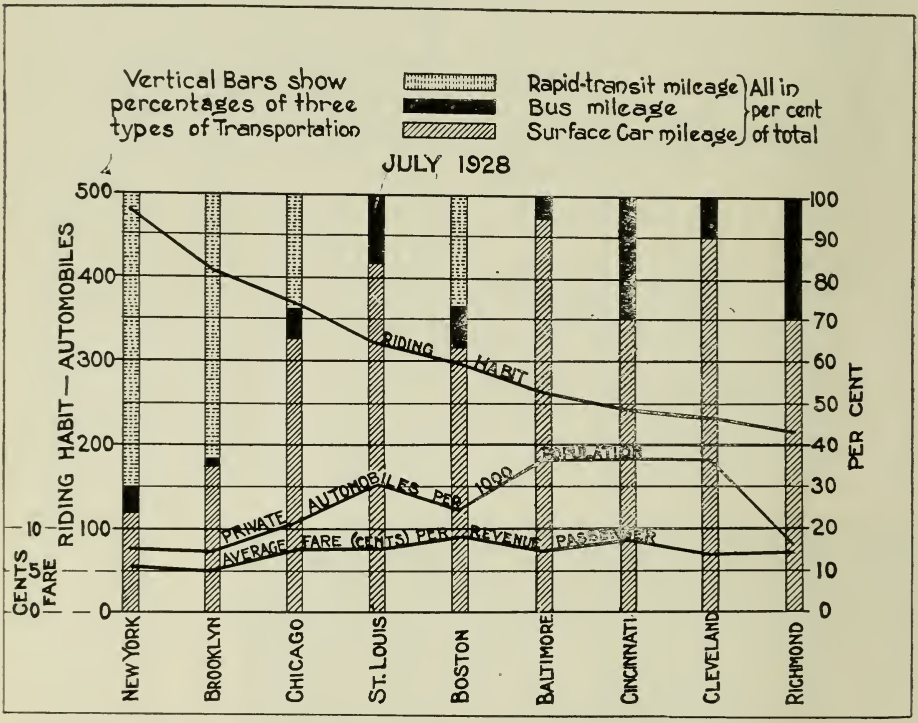
John A. Beeler, consulting engineer, distributes from time to time interesting information regarding urban transportation. He has recently compiled a table showing the annual revenue rides per capita in representative cities, i. e., the riding habit, as related to number of private automobiles per thousand of population and average fare per revenue passenger.

The accompanying chart has been prepared from Mr. Beeler's data and will repay careful study. It shows Boston in the centre with four other cities on each side. In Boston the riding habit was 301 revenue rides per year as compared with 485 in New York and 221 in Richmond.

The vertical bars in the chart show the percentages of rapid-transit, bus and surface-car mileage, the figures for Boston being 26.8 per cent rapid transit; 9.8 per cent bus and 63.4 per cent surface cars. In general the cities with rapid transit have the higher riding habit index, but St. Louis is an exception to this. In general, also, where private automobiles are most numerous the riding habit is the lowest. Boston and Richmond appear to be exceptions to this rule.

Undoubtedly the rate of fare affects riding to some extent but it is not possible to trace a direct connection between fare and riding habit, because other conditions exert a strong controlling influence.

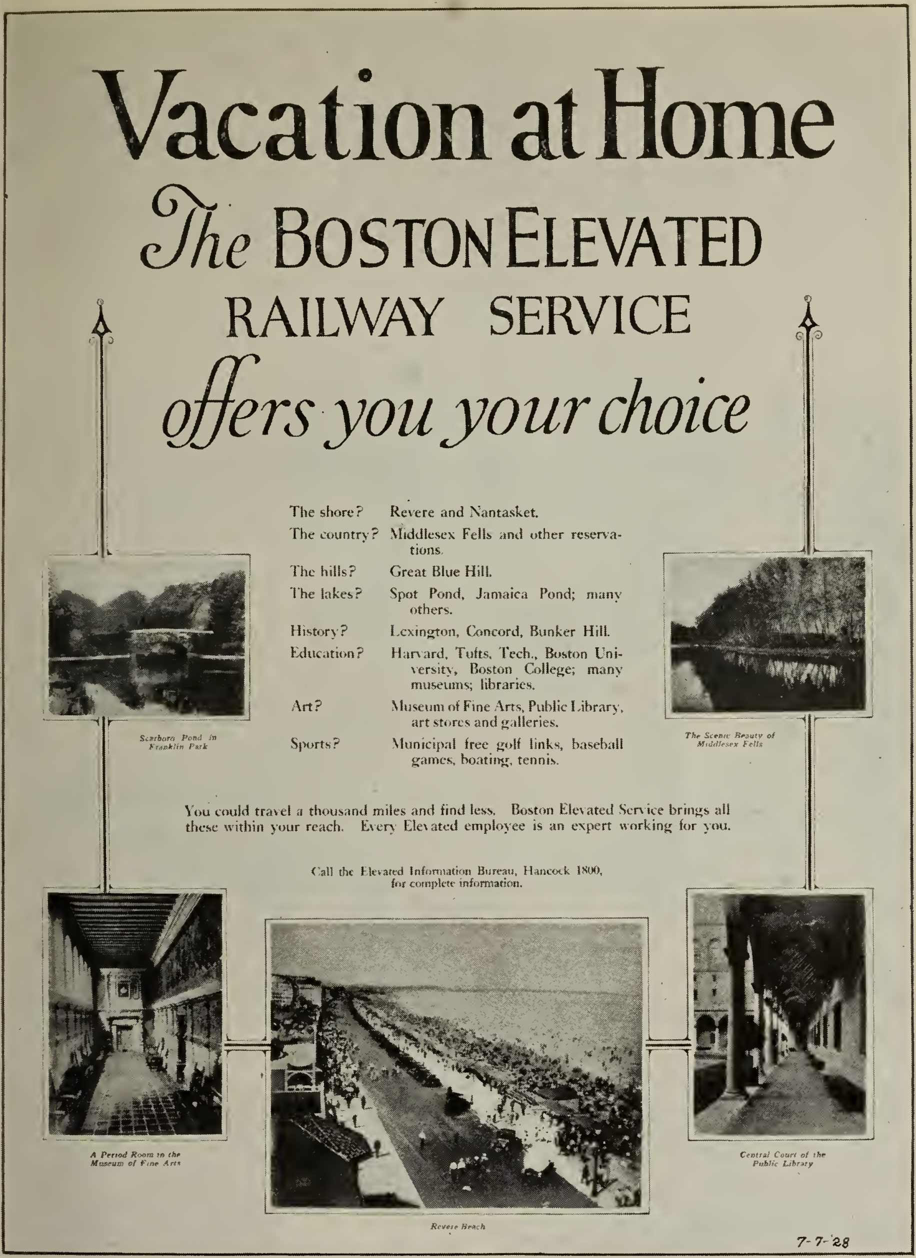
Mr. Beeler's table is reproduced below for reference in connection with the chart.



RIDING HABIT AND RELATED DATA FOR TYPICAL CITIES

ANNUAL REVENUE RIDES PER CAPITA IN REPRESENTATIVE CITIES

Year 1927	Riding Habit All Transit	Private Automobiles Per 1000 Population	Aver. Fare Per Rev. Passenger In Cents	Per Cent of Total Mileage Operated Rapid Transit	Street Car	Bus
New York	485	77.7	5.15	70.0	23.6	6.4
Brooklyn	412	71.8	4.99	64.4	34.1	1.5
Chicago	376	106.4	7.33	28.0	65.0	7.0
Boston	301	125.0	9.27	26.8	63.4	9.8
Cleveland	236	187.6	7.01		91.0	9.0
St. Louis	324	154.9	7.45		83.2	16.8
Baltimore	265	184.7	7.34		95.0	5.0
Cincinnati	244	185.8	8.70		70.3	29.7
Richmond	221	78.1	7.12		70.4	29.6



Vacation at Home

The BOSTON ELEVATED RAILWAY SERVICE *offers you your choice*

The shore?	Revere and Nantasket.
The country?	Middlesex Fells and other reservations.
The hills?	Great Blue Hill.
The lakes?	Spot Pond, Jamaica Pond; many others.
History?	Lexington, Concord, Bunker Hill.
Education?	Harvard, Tufts, Tech., Boston University, Boston College; many museums; libraries.
Art?	Museum of Fine Arts, Public Library, art stores and galleries.
Sports?	Municipal free golf links, baseball games, boating, tennis.

You could travel a thousand miles and find less. Boston Elevated Service brings all these within your reach. Every Elevated employee is an expert working for you.

Call the Elevated Information Bureau, Hancock 1800, for complete information.

Scarboro Pond in Franklin Park

The Scenic Beauty of Middlesex Fells

A Period Room in the Museum of Fine Arts

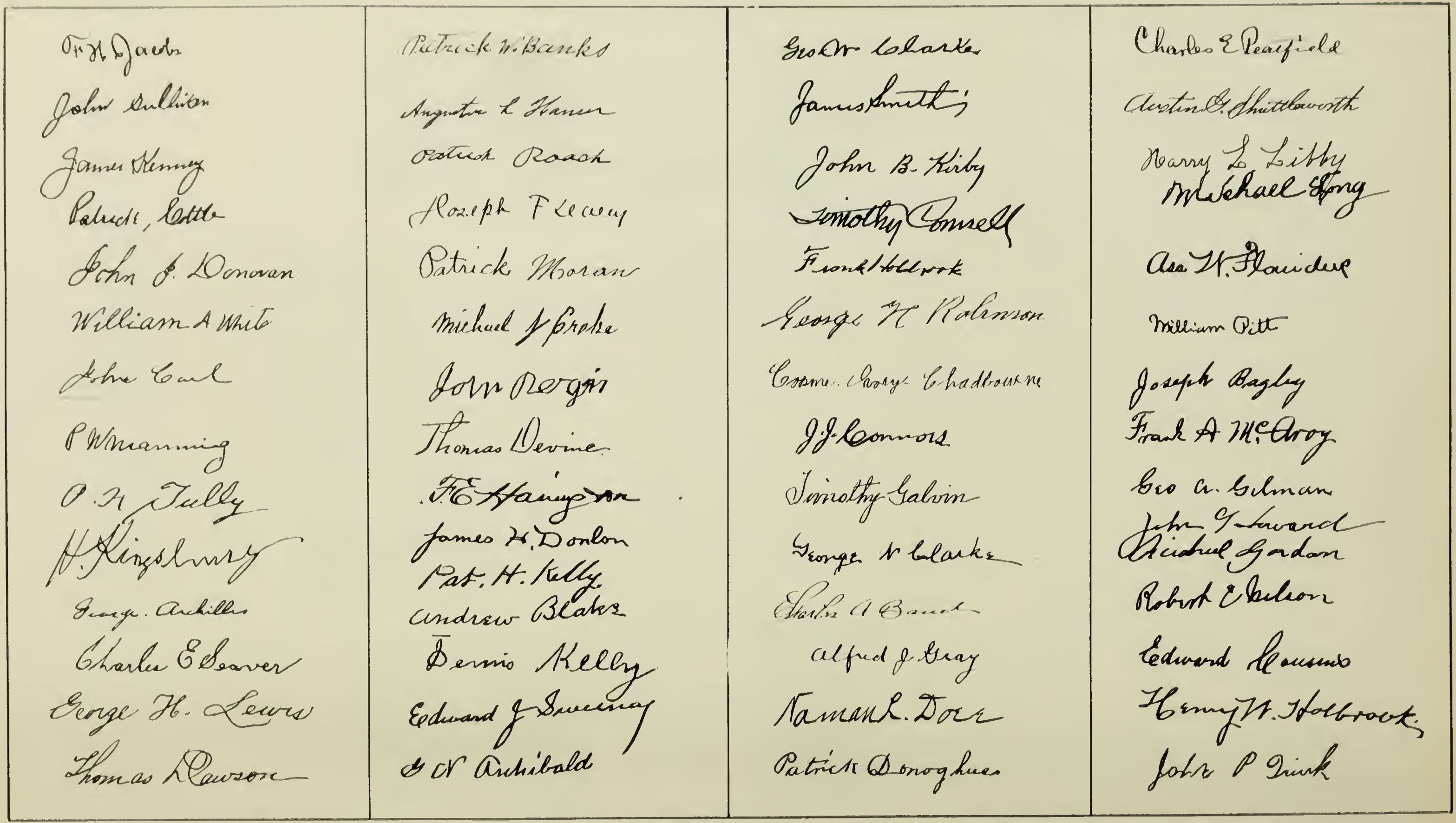
Revere Beach

Central Court of the Public Library

7-7-'28

A FULL-PAGE ROTOGRAVURE ADVERTISEMENT ON REDUCED SCALE

Of this advertisement an out-of-town house organ, in its August issue, said: "To us the advertisement seems to have been mighty well planned. . . . There is no question but what this advertisement sold many car rides. Had we been a tourist visiting Boston and seen this page, surely we would have arranged to stay over a day or two longer and take some of these trips."



F. H. Jacobs
John Sullivan
James Kenney
Patrick, Cottle
John J. Donovan
William A White
John Carl
P W Manning
P. H. Tully
H Kingsbury
George Archilles
Charles E Seaver
George H. Lewis
Thomas Lawson

Patrick W. Banks
Augustus L Hamer
Patrick Roach
Joseph F Leavy
Patrick Moran
Michael J Brake
John Rogin
Thomas Devine
F. E. Harrington
James H. Donlon
Pat. H. Kelly
Andrew Blake
Dennis Kelley
Edward J Sweeney
G N Archibald

Geo W Clarke
James Smith
John B. Kirby
Timothy Connell
Frank Holbrook
George H Robinson
Cosme. George Chadbourne
J. J. Connors
Timothy Galvin
George W Clarke
Charles A Baird
Alfred J. Gray
Nahum L. Doe
Patrick Donoghue

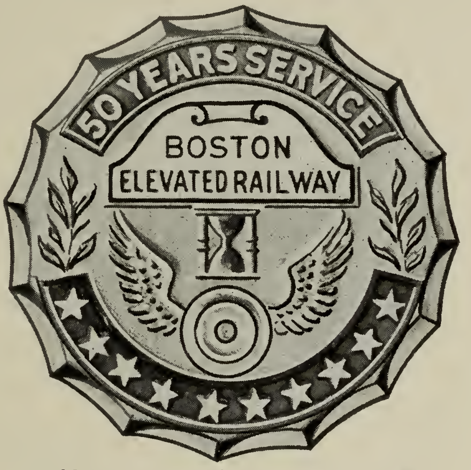
Charles E Pearfield
Austin G. Shuttleworth
Harry L Libby
Michael Long
Asa W. Flanders
William Pitt
Joseph Bagley
Frank A McElroy
Geo A. Gilman
John G Howard
Michael Gordon
Robert E Wilson
Edward Cousins
Henry H. Holbrook
John P Quirk

AUTOGRAPHS OF FIFTY-EIGHT MEN WHO HAVE SERVED THE RAILWAY FOR FORTY-FIVE YEARS OR MORE

LONG SERVICE RECOGNIZED

Railway Awards Solid Gold Emblems to Men Who Have Completed 45 Years or More of Service

Gold Emblem
Exact Size



Emblem on Large Scale to Show Detail

In 1927 and 1928 the general manager invited groups of long-service men to luncheon at the Engineers' Club. In 1927 there were twelve 50-year men present and in 1928 there were fifty-eight men who had given forty-five years or more to the service. Reproductions of the autographs of these fifty-eight men appear on the opposite page.

The general manager wished these men to have some more substantial token of their extended service and has recently had sent to each man a 14-karat gold emblem, with solid gold pin attachment. The emblem shows by its color the group to which the wearer belongs, blue for men over fifty years in service, red for 45-year men. There are numbers of stars, also, to designate length of service, ten stars for 50-year men, nine for 45-year men. Accompanying the emblem was the following letter:

You will remember that on March 19 I had together for luncheon at the Engineer's Club all of the employees of the Railway who had been in its service 45 years or more. You were among the number.

As a permanent emblem of your service with the Railway a solid-gold pin has been prepared for you showing by its color, by the number of stars (each representing 5 years of service) and by the lettering the length of your service.

Do not hesitate to wear this on duty and elsewhere as it will be a constant reminder of your long and faithful term of service.

With kindest personal regards, I am
Yours sincerely,
EDWARD DANA,
General Manager.

On this page the 50-year emblem is shown exactly like the original in size and it is also shown on an enlarged scale to bring out the detail. The wheel, wings and hourglass all suggest speed, one of the essentials of transportation. The sprays of bay leaves are a tribute to accomplishment. The whole emblem is so symbolical in design and so attractive in make-up that it is hoped that all who are entitled to wear it will do so as continuously as possible.

"EL" NIGHT-CAR SERVICE

The railway maintains a skeleton service of night cars for the convenience of patrons who must travel in the "wee sma' hours of the nicht." This service is adjusted to meet the needs of the several divisions.

Rapid-Transit Lines—There is no night-car service on the main elevated line or the Cambridge subway. In the East Boston tunnel a 30-minute headway is maintained between 1.25 A. M. and 4.55 A. M. The operating force comprises one train crew, a starter and a collector at Maverick Square and an inspector at Scollay Under.

Division One—Twelve night-car runs are operated in Division 1, one a 2-man run, the others 1-man runs. For this service thirteen car men, a division night inspector, night starters at Park street, Milton and North Point, respectively, and a night clerk are required.

Division Two—In Division 2, eight 1-man night cars are operated from Arborway Station, and two 1-man and three 2-man cars from Reservoir Station. Starters are on duty at these stations and also at Cypress street station.

Division Three—There are sixteen night-car runs in Division 3, all 1-man runs, and four night-bus runs. Thus twenty men are required for the cars; and in addition one inspector is on duty as well as five starters, located respectively at Watertown, Arlington, North Cambridge, Bennett street and Somerville garage.

Division Four—In Division 4 there are no officials on duty on account of night cars, but there are carhouse starters on duty at Salem street, Sullivan Square, Clarendon Hill and Eagle street, and a night clerk at division headquarters who oversee night-car operation as a portion of their duties. Fifteen car men are required for this service.

In connection with this subject it should be understood that some of the cars classified as "night cars" are really late-day cars which operate after 2 A. M. However, most of the runs are confined to the period between the end of one day's runs and the beginning of the next day's runs.

THE LENGTH OF YOUR BELT*

By DR. ROBERT J. GRAVES.

Chief Surgeon, Boston & Maine Railroad

Have you ever stopped to realize that every time you lengthen your belt you shorten your life? It's so, and in much the same proportion.

When your waist measure begins to equal the circumference of your chest, look; and when it exceeds it, stop! It is then high time for you to listen—listen to what the life insurance companies will tell you, that for every inch your waist exceeds your chest your chances of living out your span of life are decreased by several years.

I am not writing on the important subject of weight reduction, but on an almost equally important one of posture—the way you carry yourself when you walk, stand, sit or lie. The command of the top sergeant, "Pull in your stomach," is quite as vital to you from a health standpoint as it is to the recruit in the army.

When our ancestors gave up walking on four legs they imposed on us the burden of trying to hold up our livers and stomachs and other heavy organs by muscle pressure and "tone" against the force of gravity. When we slump and allow ourselves to get "pot-bellied," we fail in our jobs.

Of all the rules for correct posture the most important one is to pull in and pull up your abdominal muscles. See what it does to you. It automatically throws out your chest, pulls back your chin, puts your back in a better stress-bearing position and at the same time adds immensely to your self-respect.

You can't feel well, or look well, or act well, with your intestines, your stomach and liver and kidneys, sagging down. If they do, of course you will be constipated, and headachy, and blue and cross; you can't help it. But—pull in your "bay window" muscles and mark the change.

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*Reprinted by permission from "B. & M. Employees Magazine."

GRIT

By William F. Cody

Inspector Boston & Maine Railroad

When you're sent on a job, stay with it;
Don't let it make you quit.
God won't have a quitter in Heaven—
That's why he gives us our grit.

Grit keeps the engine from slipping.
Grit helps her make the grade.
Grit makes you want to do things:
Lack of it makes you afraid.

Afraid, the excuse of the coward:
Afraid piles work on the shelf.
Afraid simply proves that you're yellow;
It means you're not sure of yourself.

Tackle the job with a vengeance.
Go at it as one who cares.
A glance in a mirror will show you
You're as big as the man who dares.

Grit is just faith in yourself, my friend.
The courage to stick till you've won;
Without it you haven't a Chinaman's chance
And with it the job is done.

ELEVATED CLOSE-UP

(Concluded from Page 121)

During 1927 about 3,500 tests were made on the direct-current cables. Such cables as showed approaching failure were left out of service, the faulty sections were located and renewed, and the cables were returned to service. Seventy-eight such faults were located during

SHAWMUT STATION ON THE DORCHESTER RAPID-TRANSIT EXTENSION

1927, involving the renewal of 17,000 feet of cable.

During this same year in the 350 miles of cable only nine burnouts occurred, or approximately 2.6 burnouts per hundred miles per year. And of the nine burnouts, only one caused a loss of power. This compares very favorably with other systems of a similar nature.

Seventh Educational Season

THANKS to the cooperation of large numbers of employees, and of the committees in charge, the Boston Elevated has taken a leading position in vocational or adult education. The committee in charge of the program for 1928-29 comprises: F. W. Amadon (bureau of audit), J. P. Banks (transportation), W. H. Barnes (maintenance), E. M. Brooks (legal), W. H. Burrell (power), Miss Esther McMenimen (women's interests), A. F. McNaughton (purchasing), A. A. Ordway (rolling-stock and shops), D. J. Prendergast (treasury) and J. J. Reynolds (claims). This committee has prepared plans for the following courses, to begin on or about November 1:

Everyday Law. A series of popular discussions of what everyone should know about this subject. The course will not be technical.

Motor Vehicles. A broad and interesting operating course, which will help every driver of private automobile, bus or truck to drive better and with less anxiety about his or her vehicle.

Selling Car Rides. A series of conferences with a sales counselor to help employees make the most of their natural abilities and to sell Boston Elevated service.

Public Speaking. A continuation of this popular course, now in its fourth year in these programs, with particular reference this year to debating and procedure in conducting meetings.

Arts and Crafts. This course for women employees will be a continuation of the popular fabric-painting course of last year. It will cover several forms of art handicraft as desired by individuals. No previous training in art is required.

Home Nursing and First Aid. This will also be for women employees and is designed to help them to be of service in home, office and elsewhere. The Red Cross Society will have charge.

Foremen Conferences. There will be conferences this year in four stages: 1st, 2nd, 3rd and 4th years. Foremen who have completed a given grade will be eligible to enter the next higher one.

Group Conferences. As heretofore there will be monthly group conferences in the transportation, maintenance and rolling-stock and shops departments. The leaders are planning interesting and entertaining programs.

Correspondence Course on the "A B C of the Electric Car." The Railway has obtained the privilege of publishing a special course of ten lessons on the principles underlying car operation. A special flyer describing it is being distributed. Registrations in this course should be made at once as the publication of the course is contingent upon a reasonable advance registration.

Cooperative Edison Courses

As last season, the Edison Company and the "El" are exchanging courtesies in their educational plans. "El" employees may take the following Edison courses by registration at the first exercise:

Preparation of Technical and Business Report . Ten lessons. Instructor, Prof. Wentworth Williams of Boston University. Monday evenings at 6 P. M., 39 Boylston street. Fee $3, of which one-half will be refunded on completion.

First Aid. Ten lessons. Instructor, Dr. Benedict B. Spector. Tuesday evenings at 6 P. M., 39 Boylston street. No fee, but the text-book will cost 60 cents and there will be a 50-cent fee for those who take the examination.

It should be noted that the Edison courses begin one month earlier than the Boston Elevated courses.

Boston Madison Square Garden

Sports schedules are being made up for the new exposition and convention hall which is rapidly approaching completion at North Station. As hockey headliners the Boston Bruins will play Tuesday nights during the winter and almost every Friday night has been reserved for boxing. Harvard will play all of its home hockey games at the "Garden" and the Harvard-Dartmouth-Cornell track meet will be held there.

AMERICA'S TWENTY LEADING INDUSTRIES

(Reprinted by Permission from New York Times)

Industry	Employees	Rank	Value of Products or Service	Rank	Estimated Investment	Rank
1. Agriculture	10,241,000	1	$16,963,000,000	1	$57,000,000,000	1
2. Construction	3,051,000	2	7,000,000,000	3	(No data)	4(?)
3. Railroads	2,184,000	3	7,396,000,000	2	27,800,000,000	2
4. Textiles	1,110,000	4	5,342,000,000	4	4,100,000,000	8
5. Machinery	858,000	5	5,020,000,000	5	(No data)	9(?)
6. Lumber	474,000	7	2,254,000,000	12	8,000,000,000	6
7. Iron and Steel	438,000	9	3,711,000,000	7	5,000,000,000	7
8. Automobiles	430,000	10	4,745,000,000	6	3,000,000,000	10
9. Oil	158,000	16	2,377,000,000	11	11,000,000,000	3
10. Coal	748,000	6	1,727,000,000	14	2,500,000,000	12
11. Electricity	230,000	13	1,783,000,000	13	9,500,000,000	5
12. Clothing	466,000	8	3,239,000,000	8	1,000,000,000	16
13. Publishing	296,000	12	2,482.000,000	10	1,200,000,000	13
14. Tel. and Tel	381,000	11	935,000,000	20	2,600,000,000	11
15. Meat	120,000	20	3,050,000,000	9	1,200,000,000	14
16. Rubber	141,000	17	1,255,000,000	16	1,000,000,000	17
17. Shoes	207,000	14	1,061,000,000	18	700,000,000	18
18. Baking	160,000	15	1,268,000,000	15	600,000,000	19
19. Paper	124,000	19	972,000,000	19	1.200,000,000	15
20. Tobacco	132,000	18	1,091,000,000	17	(No data)	20(?)

CHANGES IN THE RESERVE FUND

Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*	Jan.	$191,381.71†
Aug.	408,570.65*	Feb.	75,469.39†
Sept.	147,204.65*	Mar.	159,985.97†
Oct.	79,421.50†	April	43,542.45†
Nov.	34,226.52†	May	93,645.42†
Dec.	280,536.75†	June	179,790.77†

Profit and loss credit.....$666,500.98

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*Excess of cost of service over revenue.

Fiscal Year 1928-29

July 1, 1928, $1,000,000

July	$331,329.58*

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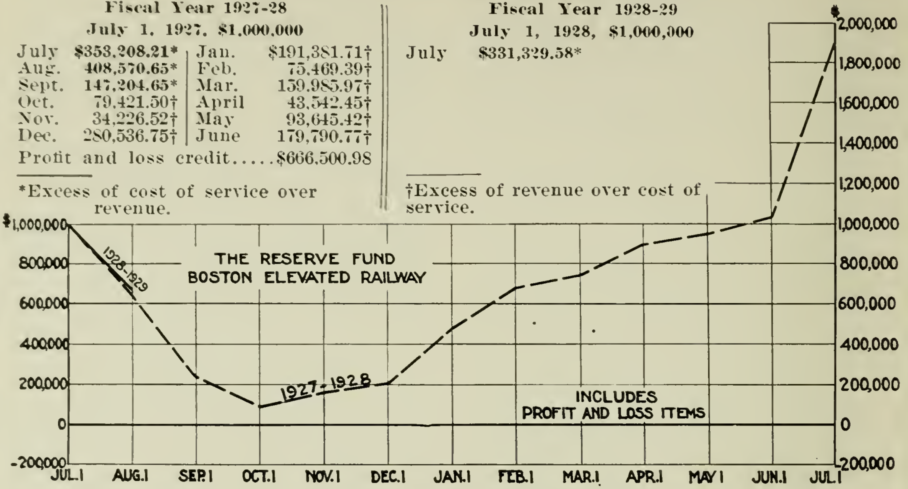
†Excess of revenue over cost of service.



JULY OPERATION

GENERAL FINANCIAL DATA	1928	1927
Cost of service exceeded revenue	$331,329.58	$353,208.21
Operating revenue per car-hour (A.E.R.A. std.)	$5.63	$5.51
Operating revenue per car-mile operated	55.89c	55.85c
Average fare per revenue passenger	9.246c	9.259c
Ratio operating expense to operating revenue	81.14%	81.70%
PASSENGERS CARRIED		
Revenue passengers	26,355,516	26,167,466
Per cent 5c, 6c and 6¼c passengers	18.99%	18.60%
Revenue passengers per car-mile operated	5.876	5.826
OPERATING FACTS		
Trips operated	580,602	581,085
Car-miles operated:		
Rapid-transit lines	1,228,237	1,152,950
Surface, two-man	1,463,274	1,637,926
Surface, one-man	1,306,885	1,234,026
Express, newspaper and sprinkler cars	987	890
Motor bus	487,873	465,875
Total miles operated	4,487,256	4,491,667
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.77*	1.87*
Accidents per 10,000 bus-miles	1.83*	2.36*
Revenue passengers carried per accident	18,370	17,770
Average number of witnesses per accident	3.39	3.64
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	17	7
Employees complained of by car riders	84	91
Car defects reported per 10,000 car-miles	3.6	3.6
INFORMATION ABOUT POWER		
D. c. kw.-hr. output gross for month	15,756,440	15,639,500
Maximum kw. load	54,500	54,280
Tons of coal consumed for power	13,197	14,021
Lbs. of coal for power per d.c. kw.-hr. at cars	1.881	2.013
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	1.11c	1.14c
Per revenue car-mile	3.94c	4.01c
Kw.-hr. per revenue car-mile	3.546	3.514

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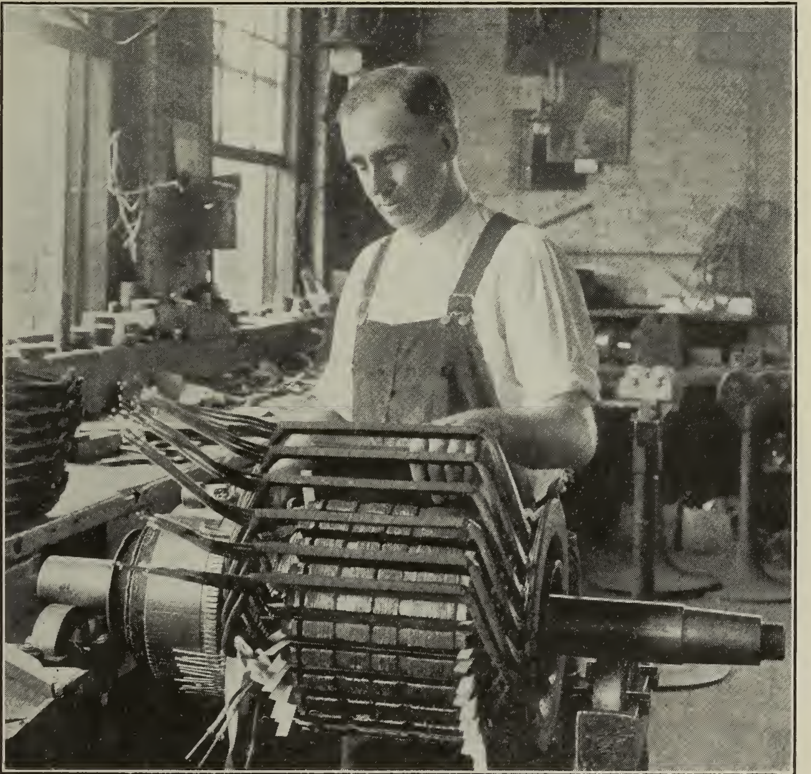
*Does not include miscellaneous accidents or derailments.

August 20, 1928. EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY
CO-OPERATION

Volume 7 SEPTEMBER, 1928 Number 9

Boston Elevated Close-Ups



THE ARMATURE WINDER
(See Page 138)

To All 'El' Employees

I have been gratified by the interest shown in the educational programs which have been prepared in recent years by special committees appointed for that purpose.

As a result the Boston Elevated Railway is recognized as a leader in this field.

The program for 1928-29 is now being distributed. It is the result of extended study by a new committee which is building upon the foundations laid by its predecessors.

The educational plan for 1928-29 is not elaborate, but it provides for the needs of all employees, both as individuals and as workers in this great public service enterprise.

On behalf of the committee I bespeak for this program the thoughtful consideration of all ambitious and forward-looking employees.

Edward Dana

FOURTH AUTOMATIC SUBSTATION IN COMMISSION

New Substation at Ashmont Will Supply Local Power Requirements for Rapid-Transit and Surface Lines. It is Similar to the Substation Recently Installed at Fields Corner

NEW AUTOMATIC SUBSTATION AT ASHMONT

COINCIDENTLY with the opening of the rapid-transit extension from Fields Corner to Ashmont to the public on Sept. 1 a new automatic substation was added to the system to furnish the necessary local power. This is the fourth example of automatic control on the Boston Elevated system, all installed within three years.

EARLIER AUTOMATIC SUBSTATIONS

The first automatic substation was one changed over from manual operation early in 1926. It is located at Oak square, on Washington street, Brighton, and contains two 2,000-kilowatt rotary converters, which change the power from alternating current to direct current as used in the car motors. (See "Cooperation," April, 1926, page 39.) This substation, as is obvious from its location, furnishes power primarily for the surface lines in this section of Div. 2.

The second example of automatic control was in the shop substation at Everett, which furnishes power for lights and motors in the local shops. There are no rotary converters here, as alternating current is used in the shops. The duty of this substation is to change the voltage from 13,200 to 550, and the frequency from 25 cycles per second to 60 cycles. Motor-generator sets are used for this purpose. This change in frequency is made because the standard distribution frequency on the system, 25 cycles, is too low for lighting. A flicker, unpleasant to the eyes, is noticeable at this frequency. There are economics at 60 cycles, also. A 60-cycle equipment is lighter and less clumsy than 25-cycle equipment. And it is easier to obtain, being standard at the present time.

The third automatic substation was one built for the Dorchester rapid-transit extension at Fields Corner, (See "Cooperation," January, 1927, page 3) and known as the Harrison substation. This, unlike the earlier substation, was designed and built expressly for automatic control. It contains two 3,000-kilowatt rotary converters, with outdoor

SIDE VIEW OF SUBSTATION, SHOWING TRANSFORMERS
Interlocking Tower at Left

oil-cooled transformers. The fourth and latest automatic substation is the one at Ashmont, to be known as Ashmont substation. It is of the automatically controlled and supervised type and is similar in practically all respects to the substation on Dickens street, Dorchester, mentioned above. The new substation is located on Beale street, Ashmont, within the area of the Ashmont terminal station. The equipment comprises two 3,000-kilowatt shunt-wound rotary converters, with outdoor oil-cooled transformers.

Alternating current is transmitted to this substation through two 13,200-volt alternating current, 3-phase cables. One is routed direct from South Boston power station, the other being a tie cable from Harrison substation.

After conversion to direct current, power will be distributed to the trolley wires of the surface lines in this district, as well as to the third rail of the rapid-transit lines, through five 2,000,000-circ. mil cables and five 1,000,000-circ. mil cables.

By way of review of the principles involved in this substation the following quotation from an earlier issue of "Co-operation" is reprinted:

General Principles

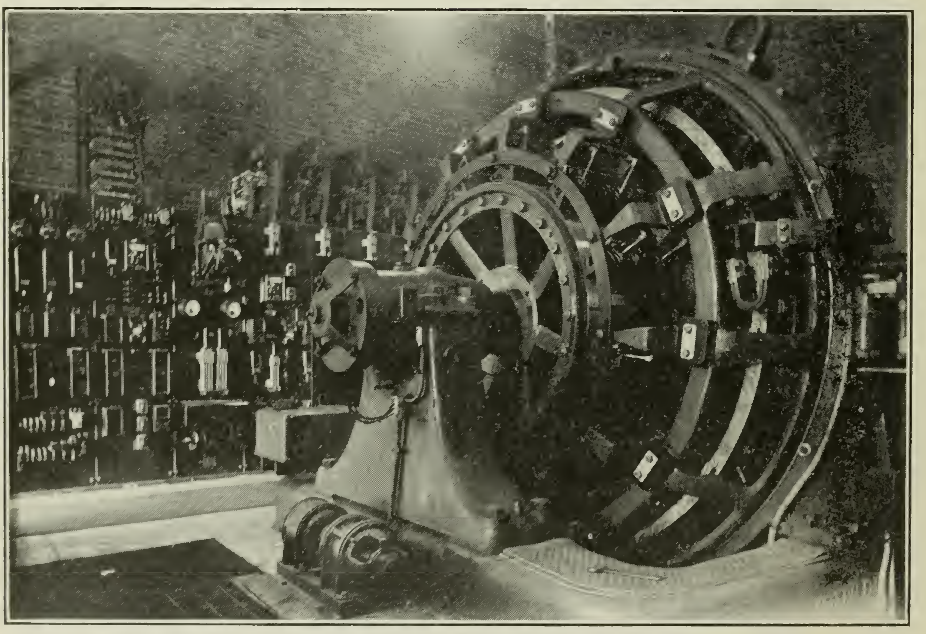
Either converter in this substation can be made the leading or trailing unit by throwing a hand-operated switch. The converters can be started and stopped by means of the supervisory system, but it is the practice to allow them to come into action and go out of action in accordance with the load demand. In case of failure of the leading unit to go into service the trailing one, after a short timing period, goes into service and through the supervisory control the system operator is notified that the leading unit has failed. In case of failure of the automatic control equipment the station can be changed over for manual operation almost instantaneously.

There is a full equipment of circuit breakers to prevent overload on the direct-current side of the machines and also load-limiting resisters, located in the basement, which hold them to their commutating capacity even if the direct-current bus should be grounded.

The Supervisory System

Reference has been made to the supervisory control, regarding which a few additional details may be of interest. Four telephone wires, rented from the telephone company, connect the substation with the system operator's office. One wire is used for operation, one for indication to the system operator of the condition of the equipment, one for the synchronizing of the selectors, explained below, and the fourth is a common return wire for the other three.

The selectors consist of rotary switches, operating at the same speed, by means of which different circuits in the substation control system are connected to the control wires in rapid succession. By this means the same control wires from the system operator's office



ONE OF THE 3,000-KILOWATT ROTARY CONVERTERS AT ASHMONT to the substation can be used to control many different parts of the equipment. Obviously these switches must rotate at exactly the same speed, hence the special synchronizing wire to connect the selector in the operator's office with the selector in the substation. The system operator can control as many operations as desired, either opening, closing, or both, at the same time. After an operation, indication is given in his office instantly. The position of all pieces of apparatus is indicated on change of position. Watthour-meter readings on both converters and on the rapid-transit feeders are transmitted to the system operator's office over this supervisory.

PROPOSED CORRESPONDENCE COURSE IS POPULAR

The proposal to furnish this season a correspondence course entitled "The A B C of the Electric Car" has met with a large response and arrangements are being made to print the lessons and begin their distribution about November 1st. The lessons will be mailed to the homes of the men. Enrollments may be sent in at any time, but it is suggested that they be sent in early so that as many as possible may be supplied with the first lesson at the same time. The first lesson is illustrated with interesting diagrams showing that many things about the electric circuit are not so very different in principle, after all, from what goes on in a water system.

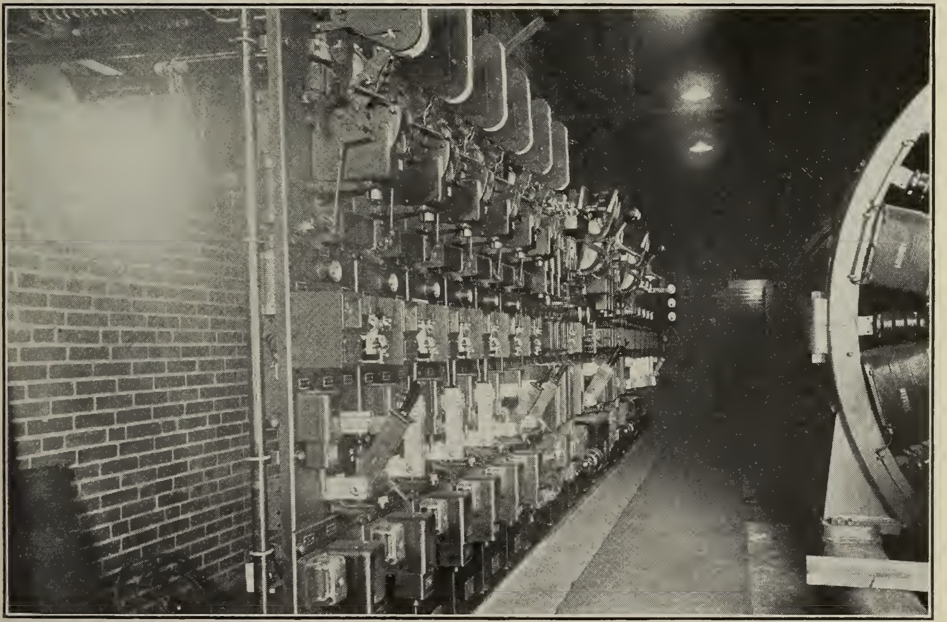
SUPERVISORS' ASSOCIATION ANNOUNCES PROGRAM

A Get-Together for General Discussion and Entertainment. General Manager Dana Will Speak at November Meeting

President J. P. Banks, of the Boston Elevated Railway Supervisors' Association, has announced the programs for the first two meetings of the Association. The opening meeting will be held on Wednesday, Oct. 17, at the Instruction School, Sullivan square, at 7.30 P. M. There will be a brief business session, with general discussion, followed by an entertainment of the type so well and favorably known in connection with last year's meetings. J. L. Troy, secretary-treasurer, will be prepared to receive the dues of $1 per member, which are due Nov. 1. Application forms for those interested in becoming members can be secured from him, care of transportation department, Park Square Building.

The speaker at the second meeting, to be held at the same place and time of day on Wednesday, Nov. 14, will be Edward Dana, general manager. Mr. Dana's topic will be announced shortly.

President Banks has appointed the following committees: on entertainment, C. H. Dey and J. A. Smillie; to assist the secretary-treasurer at meetings, E. L. Doyle, P. E. Maw and M. J. Curtin; to assist members in finding their attendance tags, J. M. Patten and T. F. Kivell.



THE SWITCHBOARD AT ASHMONT SUBSTATION

EDUCATIONAL CALENDAR FOR NOVEMBER

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1 Law for Everybody Arts and Crafts	2 Maintenance Group Conference 1st-Year Foreman Conferences	3
4	5	6 Election Day	7 Selling Car Rides	8 Motor Vehicles Arts and Crafts	9 2nd-Year Foreman Conferences	10
11	12 Public Speaking 4th-Year Foreman Conferences	13 Correct English	14 Evening open for Supervisors' Association	15 Law for Everybody Arts and Crafts	16 3d-Year Foreman Conferences 1st-Year Foreman Conferences	17
18	19 General Meeting of All Groups	20 Correct English	21 R. S. & S. Group Conference Selling Car Rides	22 Motor Vehicles Arts and Crafts	23 2nd-Year Foreman Conferences	24
25	26 Public Speaking 4th-Year Foreman Conferences	27 Correct English	28 Transportation Group Conferences	29 Thanksgiving Day	30 1st-Year Foreman Conferences	

SELLING CAR RIDES

The Second of Two Articles* in which the Author Explains the Principles of Transportation Salesmanship. Automobile Owners and Persons Now Riding Cars Come in for Attention

By DWIGHT BURROUGHS

Superintendent, Personnel and Publicity, United Railways & Electric Company, of Baltimore

IN the earlier article some of the principles of salesmanship were outlined and some qualifications for success in the field were mentioned. It was shown that a salesman must have confidence in what he is selling, and that electric railway transportation is something in which he can have entire confidence. In applying the principles to particular groups consider first the automobile owner.

Haunted during business hours

SELLING CAR RIDES TO AUTO OWNERS

Nobody begrudges the automobile owner the pleasure he derives from his vehicle. There are many good uses to which it may be put that make it a most delightful conveyance, and it is in appreciation of this fact that many street railway companies have added motor-bus sight-seeing and tours to their original functions.

On the other hand, the use of the private automobile may become—and often is—a physical, mental and financial drag upon its owner through use of it at times and upon occasions when it is a far less desirable conveyance than the street car.

The man or woman who daily uses his or her machine between home and place of business does so generally at unnecessary physical, mental and financial cost. Especially is this so in bad weather, and in the heat of summer and the cold of winter, at all of which times not only the automobile engine and its brakes and all other parts, but the driver's physical powers and his patience and his temper, are subjected to a wear and tear that make the trip a much more costly one than he imagines.

Very, very frequently this drain, or strain, is not confined to the actual running of the machine on the trip to business in the morning and the return home in the afternoon or evening. The fate of the car is on its owner's mind throughout the day. He knows that parked cars are sometimes rammed, or backed into, or sideswiped by other cars. The possibility of being tagged is another fearsome specter that stalks by day. And then, again, the car may be gone altogether, for the auto thief pursues his nefarious trade by broad daylight with fully as much gusto as by night.

These things do not happen to everybody every day, but they do happen to somebody every day, and the auto owner, transacting business in his office, or plying his trade in his shop, knows they are more than possibilities—they are probabilities. It is certainly not conducive to a peaceful state of mind to have these haunts hovering about one while he is trying to earn a living.

LOSING TIME

A natural error into which many auto owners fall is that of thinking they save time between home and office by using their machines instead of street cars. Some probably do. Some probably do sometimes. Some simply do not.

Let's take an ordinary example: Two men leave the same house, uptown or in the suburbs, at the same time, bound for the same office, or store, or plant. One goes in his machine and the other in one of his many machines, that is, he takes the street car.

The street-car passenger walks to the corner. (And he knows just about the minute the next car is due.) He steps on the car and is taken away at once directly to, or almost directly to, his destination.

Meanwhile, the auto owner has gone off to the garage. It may be on his own lot, or around the corner, or three minutes' walk. He unlocks and opens the garage door; goes in; makes a cursory inspection to see if gas, oil, water and air are all right. He gets into the machine and drives out into the alley or street. He gets out of the machine and locks the garage door. He gets into the machine, and off he goes. Down town he finds a parking place. (And please notice how quickly you can say that!) We don't know how close to his office or plant he finds that space—and neither does he when he leaves home. But the chances are that, if the trip has been a mile or so, there is not much difference

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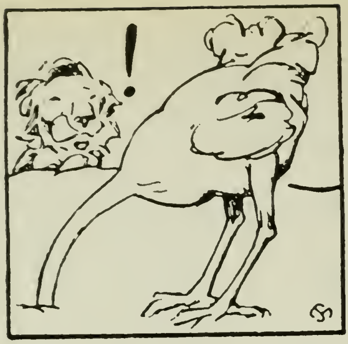
*See issue of "Cooperation" for July, 1928, page 106, for first article.



He doesn't know what is going on

between the time those two men reach their destination.

You will observe that we have given the auto owner the benefit of every favorable condition on this trip. We didn't ask him to wipe off the windshield, or to water the car, or to take back to the house his wife's wrap that she left in the auto after last evening's ride. We didn't stop him on the way down town for gas, or oil, or air, or to misguidingly pick up some misguided friend. We simply asked him to make all the traffic stops and keep within the speed limit.

We didn't more than hint at parking difficulties; not a word about the likelihood of having to drive around the block a couple times looking for a space; not a word about the probability of having to leave the machine anywhere up to a half dozen blocks from the office, store or plant.

Yet everybody on earth knows that all these things happen very frequently, and every one of them causes delay, and all these delays count in favor of time-saving for the man who rides the street car.

WHAT'S GOING ON TODAY?

There is another matter that demands consideration of the person who has to choose between street car and private auto as a conveyance between home and business place—the newspaper.

People not only like to know what is happening but it is an actual necessity in their business and their social contact with friends. The man who has not had a chance to digest the day's news as presented in the morning newspaper is at a distinct disadvantage in a business way and socially. He is a whole day behind the times, and for many purposes he might as well be ten or twenty years back.

Riding to work in the street car, the working man or woman has opportunity to read the news. Some of it may be vital to him; nearly all of it is interesting and educational and helps to fit the reader for his or her contact with others who are to be met during the day. The average working person has no time to read the paper after reaching the office, store or plant. It is a case of plunge right into the day's work. The executive is likewise situated. His mail awaits him, and those who serve under him are not in a position to proceed with their labors until he starts. If he, having driven to the office in his machine, throws himself back in his chair to read the newspapers, his whole business is tied up until he gets through.

The executive cannot afford to start the day without knowing the news. He cannot afford to throw away the opportunity of gleaning new ideas and profitable business suggestions with which the morning paper frequently provides him.

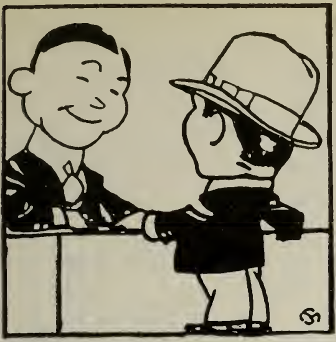
COST OF SERVICE

When we come to buy almost anything the great consideration with nearly everybody is the cost. "What's the price?" must be answered before we are willing to close the bargain. And we want some idea, too, of what it is going to cost after we pay for it—what the cost will be to maintain it, and operate it (if it is an operable commodity) and to replace it when its life is spent.

Mankind is accustomed to weighing all these matters carefully when it comes to buying anything—except transportation. In this many persons do not seem to hold thrift in very high regard. Dollars and cents may count in other affairs, but why let them interfere here?

The street car is the most economical form of transportation, and there is none other that gives as much for the money —the few cents that are paid for rides on the trolley. There are no after costs; no upkeep; no maintenance expenses for the rider; no repair bill; no supplies to buy; no insurance to take out; no damages to threaten. The passenger simply buys his ride for a few pennies and goes off with it without further worry. The first cost is the last cost of that ride.

Figure it out sometime



A "good morning" brings us back

THE WOMAN SHOPPER

The points that have been made apply with equal force to the woman shopper. The difficulty of finding parking space; the ever-present menace of the relentless distributor of tags, with the annoyance and expense of a visit to traffic court looming up in the background; the danger of theft, all these are no respectors of sex. Add to these things the tension of having to weave one's way in and out of the interminable mass of traffic in the shopping area, and we find ourselves asking, why under the sun should womankind, already ladened with an abundance of cares and tribulations, want to add to her burdens in this way?

There are many other times and occasions when the auto owner would profit by leaving the motor car home and using the street car, and he or she would have a much more pleasant and more satisfactory experience to boot. It is not contended that an automobile owner should get rid of his machine, but it is very plain that it is to his or her best interests to use the street cars on many occasions when the use of the auto would impose an unnecessary expense, unnecessary inconvenience and unnecessary mental worry. The only persons who should give up their machines are those who cannot afford them, and these generally do so when they have learned the truth through very unfortunate and disastrous experience.

Let us remember these auto truths when our friends start discussion of the relative merits and advantages of the private motor car and the street car, and probably we shall be able to sell some car rides.

SELLING CAR RIDES TO PERSONS NOW RIDING CARS

Is there such a thing as selling more car rides to persons who now ride the cars?

Certainly.

Make any commodity pleasant and attractive, and prove its usefulness, and you will have your customers coming back for more. The grocer knows this, and so does the druggist, and the hatter, and the clothier, and the dealer in every class of articles. It is equally true of the street car.

Platform men have exceptional opportunities to sell more rides. Politeness, consideration of the comfort and convenience of passengers, skill in operation, all impress the rider and send him on his way with a kindly feeling for those who operated the car upon which he traveled.

There are stores we like to visit and salespeople we like to wait upon us, because they are pleasant stores and pleasant people.

Some store people lounge back against the shelves and stare at you with a sort of wonder-how-much-of-my-time-this-bird's-going-to-take expression. We don't like them and we do not return to their counters any oftener than we can help.

Some store people glumly growl:

"What you want?" We don't like them and we don't like their stores. What we want there we get as quickly as possible and get out.

"GOOD MORNING"

But there are other salespeople. They speak to us pleasantly. They seem to take an interest in us and our wants, and try to help us get suited. And when we leave there is a smile and a very pleasant "Thank you. Call again." We like them; we like their stores, and we do go back, sometimes even when we could make our purchases at more convenient but less pleasant stores.

This Railway has often been complimented upon having agreeable employees. Persons have said over and over again: "We like to ride on So-and-So's car; he's such a pleasant fellow."

Having that said of every motorman and conductor on the system would be a wonderful asset for any street railway in the country, and it would be a business-getter—making more rides. A

We like pleasant salespeople

smile and a cheery "Good morning" as each passenger comes into the car will make a pleased carload of passengers. Suppose the general manager of this Railway were in charge of the rear of the car, can we imagine that anyone—old or young, rich or poor—could board that car without being greeted with "Good morning" and a smile? Kindness and friendliness are marks of gentility and the stamp of the gentleman, and just as surely so at the front and rear ends of street car platforms as anywhere else.

Very briefly stated, the conductors and motormen of the cars are the greatest factors in making good will or ill will for the Railway, but every other one of us has his important duty in this matter.

Summing up this whole matter of selling more car rides, our first business is to do as thoroughly and as efficiently as we can the particular work for which we are employed. And our second business is to stand loyally by our Railway and the service it gives in our contract with our associates outside of the Railway—the Public, with which we come into contact.

"EL" PRACTICES PRAISED

In an article in the Electric Railway Journal of September 8, entitled "Smoothing the Way for the Ride Prospect," several references are made to the Boston Elevated Railway practices and there are illustrations from Boston. Regarding the "El" the article states: "Boston probably offers the best example of American practice. (I. e., in regard to signs for the convenience of patrons.) Illuminated signs over the station name the next train or car so there is no needless edging to the front of the platform. When the patron enters the train he finds an 'Order of Stations' posted on a panel so he can read in peace with no chance of passing his station. . . . The Boston Elevated goes a step farther (than other railways mentioned) and carries special signs on its cars when it operates over 'diverted' or short routes. . . . In Boston the time limit (on transfers) is indicated by a plain printed line at the end of a series of tear-off coupons for successive hours."

ELEVATED CLOSE-UPS

The Armature Winder

(See illustration on front cover)

THIS month's "close-up" picture is one of an armature winder at his work. The armature is, of course, the vital part of the motor or generator, and its proper maintenance is essential to reliable operation. In the picture the winder is shown placing form-wound coils in the slots preparatory to forming them into place and connecting the leads to the commutator segments, after which they are soldered.

The commutator is seen at the left. (Details of the winding of an armature will be covered in an interesting manner in the correspondence course on the "A B C of the Electric Car," which forms a part of the coming season's educational program.)

The armature winder's work consists in repairing and rewinding armatures for railway and stationary motors, repairing and rewinding direct-current generators and rotary converters; also rebuilding transformers in the several power stations and substations. All of his work is subject to a ground test and a short-circuit test.

An average of 5,000 armatures go through the armature shop in the course of a year. Of these 25 per cent have to be rewound. The time required for rewinding, the operation illustrated on the front cover, is from eight to forty hours, depending upon size and type.

In the making of the coils which are used during a year a total of about 54,000 pounds of copper is required. In the insulation of the coils the following quantities of supplies are necessary: varnished cambric tape, 2,100 pounds; ¾-inch linen tape, 2,100 yards; ¾-inch mica tape, 1,000 pounds; fish paper and mica, 700 pounds; black coil varnish, 1,800 gallons.

HAVE YOU MADE A WILL?*

This Lecture Covered the "Last Will and Testament," Rights of Heirs and Next of Kin in Case of Intestacy, Rights of Widows, Etc.—Also Some Facts About The Probate Court

By JOHN E. HANNIGAN, ESQ.
Attorney at Law, Boston, Mass.

(A person who dies leaving a will is said to die *testate*, and is called a *testator*. A person who dies without leaving a will is said to die *intestate*. Intestacy is a form of will. A *legacy* relates to personal property; a *devise*, to real property. A *will* means the mental attitude. A *testament* means putting the will on paper and signing it.)

THE idea of the will and testament is probably one of the oldest legal ideas in the world. It probably is as old as accumulated property, and as ancient as the human instinct to control one's property after death. An Egyptian will made 4,600 years ago, discovered in a pyramid, now in a museum, shows that the ancient testator who made it, or his lawyer, expressed about the same ideas as we express today.

During the centuries since that old will, and probably before, the last will has caused litigation, brought discord and unhappiness, joy and prosperity. How much of the education, religion and charity of the world depends upon funds provided by wills is hard to say, but it surely is a great part and always has been.

Some Beneficent Wills

Caesar left all his parks "this side Tiber" to the people of Rome. The people of this city have been enriched through the wills of wealthy public-spirited men. Take only a few remembered instances: Franklin Union, where this lecture is given, owes its existence to the will of Benjamin Franklin, a Bostonian. He left a fund of $5,000 to be put at interest for a century, a part of the accumulation then to go to some civic benefit. Franklin Union is the result of the first hundred years' accumulation. The remainder will stay at interest until the end of the second century, when the entire accumulation will be used for some civic purpose.

Wentworth Institute owes its fine school and endowment to the will of Arioch Wentworth, a Bostonian. His will was bitterly contested and a compromise reached, but a substantial sum remained for the Institute.

George R. White, a Bostonian, left a large fund to the city of Boston for the benefit of all the people of Boston. The bequest is being successfully administered with a view to making the city a better place to live in, a more desirable and more beautiful place than it would be otherwise.

No Constitutional Right to Will Property

The wealth of all the world passes through the Probate Court every thirty years. Although so much property is distributed by means of wills or intestacies, the fact is that no man has a constitutional right to decide who shall be the owner of his property when he dies. The state in reality decides it. At present it gives the living owner the right to say who shall succeed him. That is a right that is granted by grace of government. The Massachusetts legislature probably could withhold it at any session if it chose to do so, subject, perhaps, to being overruled by a referendum. There is nothing in the federal or state constitution to forbid such a law. An inheritance tax is thus not a tax on property, but on the right of an heir, next of kin, or beneficiary under a will to receive the gratuity of the deceased. It is the price a new owner must pay for the privilege of inheriting. An estate tax is much the same thing, except that it is a tax upon the privilege of the owner, now dead, to say who is to be his successor in the ownership of his property after he ceases to be owner. His estate must pay for the privilege of carrying out the desires of the man who in his lifetime was the owner. Of course, the more valuable the right to transmit or receive, the higher and yet higher the price.

"Making a Will"

There are two main formalities essential to the making of a will. A will in Massachusetts and nearly everywhere must be in writing, not necessarily the writing of the testator, but it must be signed by him, and persons not mentioned in the will must sign their names as proof that they witnessed his signature. Massachusetts requires three witnesses. The witnesses must sign in the testator's presence, and it is better if they all sign in the presence of one another, but they need not know the contents of the will and possibly they need not know they are witnessing a will. They must sign after he signs, they must know they are witnessing his signature, and they must sign at his request.

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*Abstract of the ninth lecture in the course in Everyday Law, F. W. Casey and E. M. Brooks, Committee in charge, delivered at Franklin Union and Sullivan Square, Monday, March 5, 1928.

Wills not drawn by good lawyers may be probated, but such wills make trouble in interpreting their meaning, and wills not executed under the supervision of lawyers often fail of probate, even if the testator's meaning is clear. There must be strict compliance with the law in the signing and witnessing of wills.

UNWRITTEN WILLS

In certain cases good wills can be made without writing. These are called "nuncupative" wills. Such wills may be made only by soldiers in actual service or seamen in service on the sea.

UNDUE INFLUENCE

Wills must be made without such pressure or influence from other persons as deprives the testator of free exercise of his own will. The law says that a will obtained by duress or undue influence is not the will of the testator, but of someone else, and it will be disallowed. There can be proper persuasion or due influence. A will may be sustained even though it be grossly unjust or neglectful of just claims. A free will, however unjust and unreasonable, will be carried out. But such an unjust or unreasonable will does not require as strong evidence of undue influence to upset it as would a just and reasonable will. A minor cannot make a will in Massachusetts, nor an insane person.

COMPROMISING OF WILLS

It is possible after the testator's death to alter his reasonable will properly made. After the will is probated, all the beneficiaries mentioned in the will and all those who would have a right to inherit from the testator, if he had died intestate, may sign an agreement to change the will to suit themselves and the court will put the agreement into effect. The testator's intention may thus be entirely ignored. On the other hand, this really means that new owners are readjusting their new property rights to suit their own mutual convenience. Probably a provision in a will that it should not be compromised would not be recognized. But a provision that any legatee who contests the will should get nothing would be enforced by the courts if the will was sustained.

WHEN NO WILL IS LEFT

Many people die intestate, sometimes intentionally, and the law provides a plan for disposing of their property. Subject to the rights of a surviving husband or widow, the property goes to his or her children; the children of dead children take their parent's share; the children of dead grandchildren take their parent's share. If there are no descendants, the property goes to the decedent's father and mother, or one of them if only one is alive. If there are no descendants and no father or mother, the property goes to brothers and sisters (including half brothers and half sisters), and the descendants of any dead brothers and sisters, the descendants taking the share of their parent. If there are no brothers or sisters or descendants of dead brothers or sisters, the property goes to grandparents, if living, and if not, to first cousins. First cousins are those who have the same grandparent; second cousins have the same greatgrandparent. Where A's grandparent is B's great-grandparent, A and B are first cousins once removed. In England, by a recent law, a second cousin is not regarded as a kinsman entitled to inherit. A first cousin once removed is nearer than a second cousin, because the former is descended from a nearer common ancestor.

A surviving wife has two alternative rights. One is a right of dower, i. e., a widow's interest for her lifetime in one-third of the real estate owned by the deceased at any time during the marriage, except real estate to which the widow had signed off her rights by joining in conveyances by the deceased spouse. Such dower right must be claimed within six months after the appointment of the administrator. If the estate is plainly insolvent, the benefit of this right will be claimed, since it takes precedence over the claims of creditors of the deceased. It is only a life estate. But if the net estate is substantial and there is no will, the widow will claim the statutory right now to be mentioned, namely (a) if there are no children, $5,000 plus one-half the remaining real property (i. e., land and buildings) and one-half the remaining personal property (i. e., bank accounts, stocks, bonds, personal belongings, etc.), or (b) if there are children, one-third of all the real property and one-third of all the personal property. This is statutory heirship, so called, and is an absolute estate. The creditors must be paid in full before the widow can receive anything as a statutory heir. If the widow claims the one-third life dower right in real estate above mentioned, that right will be received in lieu of the interest in real estate, which she could otherwise claim by virtue of the statutory rights above mentioned.

RIGHT OF SURVIVING HUSBAND OR WIFE DISSATISFIED WITH THE WILL. RIGHTS OF THE CHILDREN

Such a husband or wife can within six months of the probate of the will file in the Probate Court a paper relinquishing rights under the will, and thereupon he or she becomes entitled to the same portion of the property that he or she would have taken if the deceased had died without leaving a will; except that if he or she would thus take more than $10,000 in value, he or she will be entitled to $10,000 in value outright, but only to the income (for life) of any excess above $10,000. Thus a husband or wife cannot effectually make a will depriving the surviving spouse of all interest in his or her estate. But the surviving spouse cannot accept the benefit of provisions made by the will and at the same time claim the right of curtesy or dower above mentioned, "unless such plainly appears by the will to have been the intention of the testator." But a wife or husband who accepts the provisions of a will without claiming any further right is entitled to have those provisions carried out even if this exhausts the estate and leaves nothing for any other legatee or devisee.

Though a testator thus cannot by his will "cut off" a wife or husband from all interest in his or her estate, he or she can "cut off" a child, with or without reason. Heirs as such have no vested rights in a living person's property. If the will of a testator omits all mention of any of the children, or issue of deceased children, "they shall take the same share of his estate which they would have taken if he had died intestate, unless they have been provided for by the testator in his lifetime or unless it appears that the omission was intentional and not occasioned by accident or mistake." If it is desired to make no gift to a child, the will should so state explicitly, or the testator should make a gift of a nominal amount to the child, thus showing that the child was not forgotten. But even if the will does not mention a child, it may yet be proved by outside evidence that the omission was intentional.

WHAT DOES THE PROBATE COURT DO?

When a man dies, his affairs are often in confusion. There may be contracts unfinished, obligations undischarged and certain and uncertain debts to be paid, and obligations owed to the testator to be collected or adjusted. Difficulties connected with personal and real property very likely need to be straightened out. Whether the estate be in good shape or bad shape, the Probate Court, at the request of someone interested, appoints a man of responsibility and discretion to take charge of the estate. He is called an administrator, in case of an intestate estate, or an executor if he is nominated by will. For the purpose of winding up the estate the executor or administrator takes the place of the deceased, and in Massachusetts he has one year in which to complete his work, pay his decedent's debts, collect the debts due and other assets and then distribute the net balance of the assets to the heirs or legatees. He is a trustee and is held to strict accountability. He is the conduit through which title to personal property passes to the new owner. For the time being the administrator or executor is the owner of the personal property and he is the debtor who personally owes the decedent's debts. Real property goes direct to the new owners, but it may be taken away from them if personal is insufficient for debts.

There is a Probate Court in every county in Massachusetts. In this court wills of residents of that county are proved or disallowed; heirs and next-of-kin prove their relationship; creditors come to prove their debts; widows to renounce their interest under wills and claim their legal rights in lieu thereof, and widows and children to claim temporary allowances for support, and executors and administrators make their accounting and get their final discharge.

WHEN IS A MAN LEGALLY DEAD?

The estate of a man cannot in general be effectually administered unless he is dead, no matter how general the belief or how convincing the proof that he is dead. A court judgment that a man is dead can be reversed. If he ever turns up the supposedly good administration becomes a nullity, and the executor or administrator who has distributed the estate will have to pay it back to the owner who did not die. But the case of long absence without news is covered by a statute which permits the appointment of a receiver of an absentee's property. Such receiver after fourteen years from the date of disappearance as established by the Probate Court, may be authorized by the Court to distribute the assets of the estate among those who would have been the heirs and next-of-kin of the absentee, as if he had in fact died intestate fourteen years after the date of disappearance. That distribution is valid and final, even if the absent one now answers present, or his will is presented.

THE PROBATE COURT A BENEFICENT INSTITUTION

The Probate Court is a versatile court and a busy place. Formerly it was a church court. To some extent it remains a sanctuary. It shields the insane. It aids the wronged wife. Children are granted new parentage and good homes through adoption and change of name. Some states call it the orphan's court. It sets an example of fidelity to a trust and holds its appointees to high faithfulness in the administration of duty. We are all beneficiaries under some trust, and we are all trustees for the benefit of others. Life is a trust.

ANSWERS TO QUESTIONS

This lecture brought out a great many questions, a few of which with answers are given below:

Q. Are the signatures of the witnesses or that of the testator supposed to be on a will first?

A. The testator's signature must be on the will first.

Q. How soon can an estate be settled?

A. It should be settled in a year and must be settled in that time unless lawsuits are pending at the end of the year.

Q. Can it be done in less than a year?

A. It may, but the administrator takes a risk if he distributes the estate before the end of the year. Claims may be presented during the year for which he would be personally responsible. If the administrator is satisfied, he may act quickly. He may protect himself by taking a bond from the beneficiaries.

Q. Does an administrator present a bill for a fee?

A. In effect he explains to the judge how much work he has done in settling an estate and the judge decides what is a fair and reasonable amount to give him. This is a legitimate charge against the estate and takes precedence over all other claims.

Q. How long need a man be missing before he is officially declared dead, for example, in the collection of insurance?

A. After seven years of unexplained absence and silence, a man is presumed to be dead if during that time he has been sought. So the court holds. Insurance companies within that time may accept such proof as satisfies them. They agree to pay upon proof of death. They do not necessarily agree to pay on proof of seven years' absence. An estate will not be administered as a dead man's estate except at the risk of his turning up and vacating the whole proceeding. If the insurance companies pay voluntarily and the man comes back they can get their money back. If you were a life insurance company you wouldn't pay unless you were sure.

Q. Is the chancery court of Great Britain the same as our Probate Court?

A. The subject matters over which it has jurisdiction include some of the subject matters over which our probate courts have jurisdiction, but in general the chancery court is like our equity court, and not like our probate court.

KEEPING THE JOB SAFE

The construction section of the Massachusetts Safety Council recently conducted a contest along accident-prevention lines. Suggestions from the contestants as to "how to make the job safe" brought out such answers as the following:

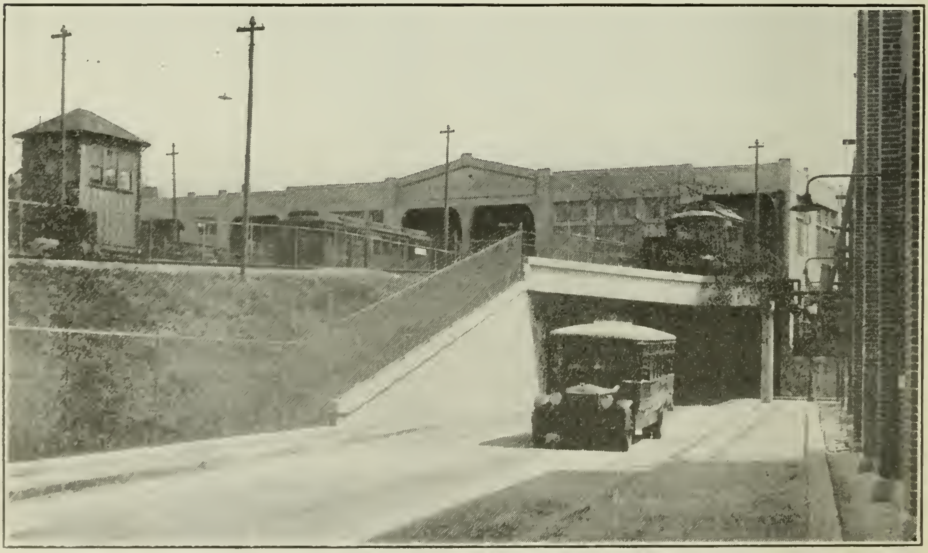
Nothing contributes more to the safety of a job than persistence in keeping it clean and material neatly piled.

It is easy to stir up spasmodic efforts along safety lines by occasional mass meetings at noon hours, but another thing to keep up these efforts day after day, especially on a long job.

Don't forget that until a job is completed every individual working is actually under your care, and should be taught to protect himself. No man can keep his family from a hospital bed.

Any man who is a careless worker should be given special instruction in safety measures, and if he then persists in his dangerous habits he should be removed. He is a menace to his fellow workmen.

I have been a workman on a job for 15 years and have never been injured. If a man uses his head, from his ears up, he will never get hurt.



THREE FORMS OF TRANSPORTATION ILLUSTRATED AT FIELDS CORNER

EDUCATION HAS NO SATURATION POINT

By DR. FRANK CRANE

THERE is a saturation point in everything except one. And that is education.

A man cannot know too much or have a too well trained mind any more than he can have too much health or be too good.

The meat business and the cracker business can get just about so big. But you can't expand the human stomach. When it gets full it can't get any fuller. Hence there is a limit.

You can raise enough wheat to feed all the people, but when they are all fed you can't sell any more wheat.

I suppose when there are enough automobiles to carry everybody where they want to go, the automobile business will reach its saturation point.

After that point the only thing, according to many people, is export trade abroad.

But America has another outlet. It simply increases the wants of its own people so that they want better supplies and more of them.

Some have often doubted the advisability of educating everybody. They assume that there must be a mass of ignorance or the country will not get along well.

America's experience has shown that the more the lower classes of America are educated the more they cease to be lower classes; their wants multiply and their powers of consumption increase; therefore the best outlet for additional consumption of goods over the saturation point is a more intelligent population.

Education is the one thing in which there is no saturation point. You cannot have a population too well educated. Their education makes them better workmen and better laborers. They will be worth more money and with the additional money they earn they will increase the consuming power of the country.

The business of creating schools, therefore, and employing teachers, and training children is one that cannot be pushed too far. It increases and makes prosperous the affairs of those who support them.

The more education we have the sounder is our democracy, for while a monarchy or an oligarchy may depend upon a foundation of ignorance, the more intelligent a democracy is the finer it will be.

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CHANGES IN THE RESERVE FUND

Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*	Jan.	$191,381.71†
Aug.	408,570.65*	Feb.	75,469.39†
Sept.	147,204.65*	Mar.	159,985.97†
Oct.	79,421.50†	April	43,542.45†
Nov.	34,226.52†	May	93,645.42†
Dec.	280,536.75†	June	179,790.77†

Profit and loss credit.....$666,500.98

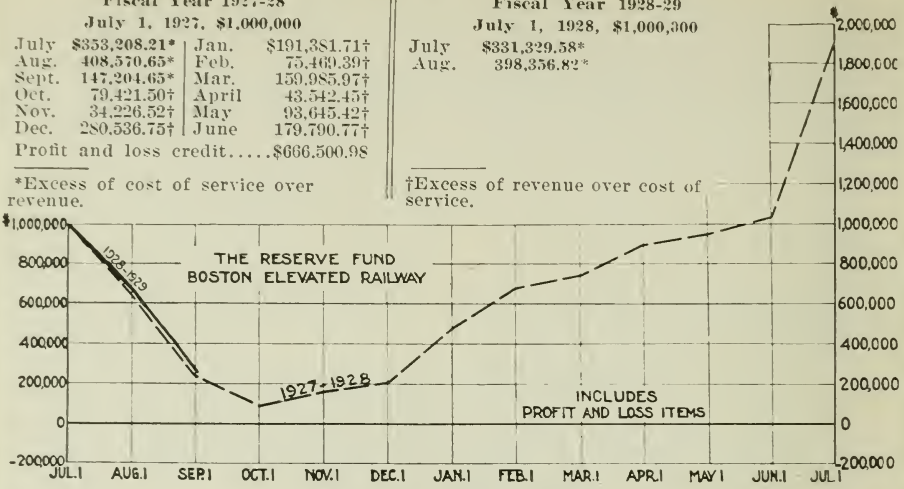
*Excess of cost of service over revenue.

Fiscal Year 1928-29

July 1, 1928, $1,000,300

July	$331,329.58*
Aug.	398,356.82*

†Excess of revenue over cost of service.



AUGUST OPERATION

GENERAL FINANCIAL DATA	1928	1927
Cost of service exceeded revenue	$398,356.82	$408,570.65
Operating revenue per car-hour (A.E.R.A. std.)	$5.49	$5.53
Operating revenue per car-mile operated	55.00c	56.05c
Average fare per revenue passenger	9.234c	9.271c
Ratio operating expense to operating revenue	83.71%	84.48%
PASSENGERS CARRIED		
Revenue passengers	25,957,681	26,274,417
Per cent 5c, 6c and 6¼c passengers	19.20%	18.47%
Revenue passengers per car-mile operated	5.765	5.853
OPERATING FACTS		
Trips operated	585,336	584,042
Car-miles operated:		
Rapid-transit lines	1,242,306	1,163,744
Surface, two-man	1,470,567	1,653,253
Surface, one-man	1,284,499	1,216,433
Express, newspaper and sprinkler cars	1,013	939
Motor bus	505.232	454,351
Total miles operated	4,503,617	4,488,720
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.53*	2.02*
Accidents per 10,000 bus-miles	2.20*	2.60*
Revenue passengers carried per accident	16,950	16,560
Average number of witnesses per accident	3.42	3.34
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	19	7
Employees complained of by car riders	89	81
Car defects reported per 10,000 car-miles	3.0	3.4
INFORMATION ABOUT POWER		
D. c. kw.-hr. output gross for month	15,777,960	15,842,160
Maximum kw. load	53,820	53,120
Tons of coal consumed for power	12,801	14,374
Lbs. of coal for power per d.c. kw.-hr. at cars	1.822	2.039
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	1.09c	1.27c
Per revenue car-mile	3.15c	4.53c
Kw.-hr. per revenue car-mile	3.526	3.554

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*Does not include miscellaneous accidents or derailments.

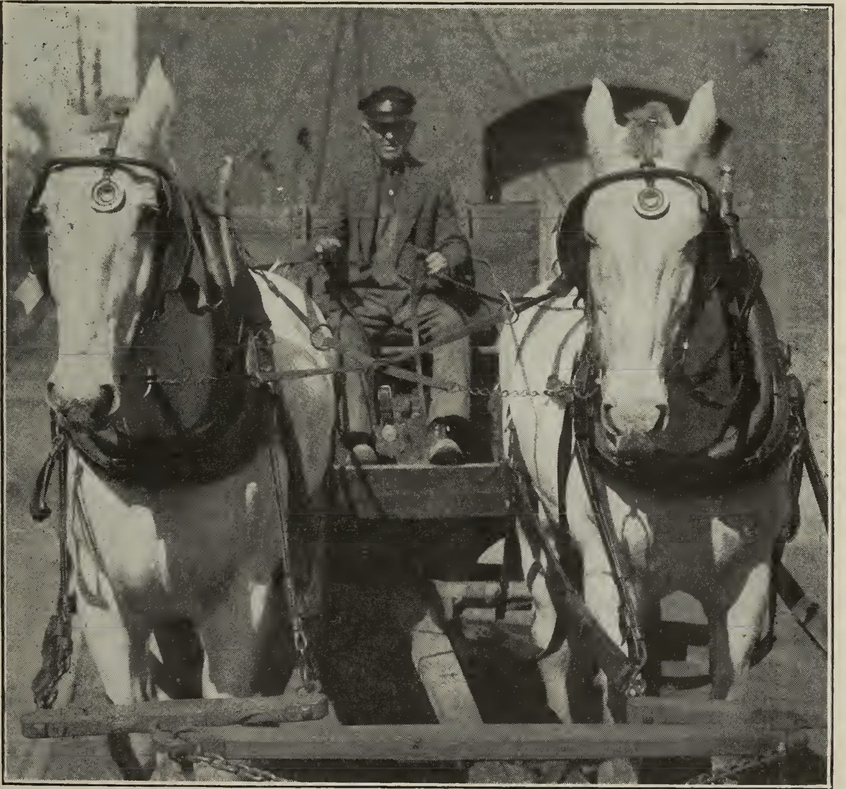
Sept. 20, 1928

EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY
CO-OPERATION

Volume 7 OCTOBER, 1928 Number 10

Boston Elevated Close-Ups



THE LAST RAILWAY HORSES

(See Page 155)

To All 'El' Employees

TO DO a 100-per cent job in giving first-class transportation service to the community, which is our honest and earnest purpose, we should realize that with each assignment go specific duties which must be conscientiously performed in furnishing this service.

In addition to the performance of these duties there are other opportunities for making the service attractive, particularly in those contacts with the public which are so numerous in some branches of the service.

Each contact affects the frame of mind of the patron to some extent, favorably or unfavorably, and good manners, or acts of politeness, put the "piano finish" on the service.

In the words of Lord Chatham:
"Now as to politeness . . . I would venture to call it benevolence in trifles."

Edward Dana

The Yardmen's Building, with Track and Yard in Foreground
Codman Street Is in Right Center of Picture

WHAT IS THE CODMAN STREET YARD?

This Article Contains the Answer—The Yard Is Part of the Dorchester Rapid Transit Extension—It Contains a Loop Track and Several Storage Tracks—Sixty Cars Can Be Accommodated Now and There Is Ample Room for Expansion

SOUTH of Ashmont Station is the Codman Street Yard, so-called. When trains terminate their run at Ashmont Station, they proceed south, either going to the relay track between Ashmont Station and the Southern Artery or continuing over the bridge spanning the Southern Artery to the Codman Street Yard. If a train is to go immediately back into service, the relay track only is used. If it is to be laid up, if additional cars are to be attached to the train, if the length of the train is to be reduced, or if inspection or other work is to be done in connection with it, the train goes to the yard.

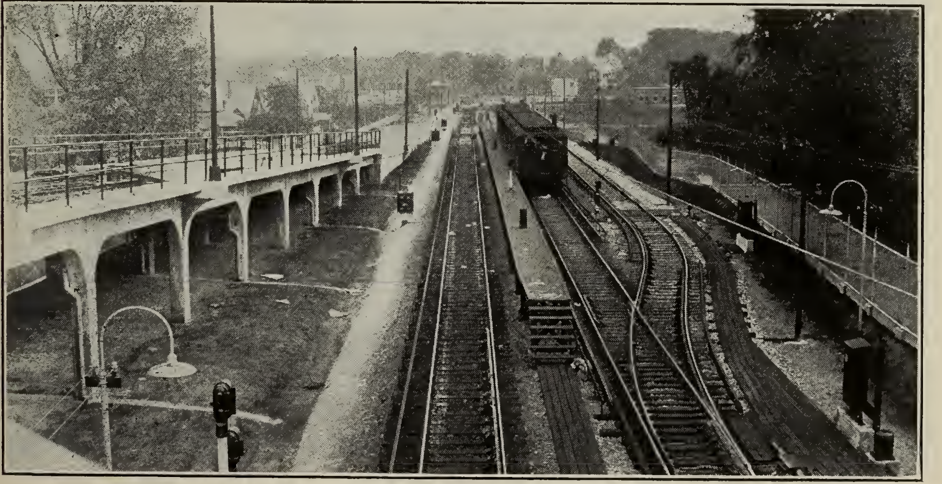
The relay track south of Ashmont Station is parallel to the two main-line tracks. Between the north-bound and south-bound tracks is a raised wooden platform installed for the purpose of allowing the train crew to change ends quickly and to facilitate the cleaning of the train that is to go back into service immediately.

All of the switches and signals between Ashmont Station and the entrance to the Codman Street Yard are controlled from Tower Q.

This section is well lighted by overhead illumination and suitable plank walks have been provided so that the trainmen, inspectors and others can safely and readily walk between the yard and the station.

REASONS FOR THIS LOCATION

The Codman Street Yard is located on a large tract of land containing about 1½ acres just south of the new South-



Looking South Along Trainmen's Platform, Codman Street Yard in the Background

ern Artery and west of the high-speed trolley tracks that will later lead to Mattapan.

The yard was located here for three reasons: First, because the area available was sufficient; second, because practically all of the land was already owned by the city of Boston, this area having been used formerly as a stone quarry from which broken stone for the repair of streets was obtained; third, it was located in the proper position south of, or beyond the terminal station, which corresponds to the location of all storage yards on the rapid-transit lines of the Boston Elevated Railway system. This is one of the fundamentals that must always be remembered with respect to economical and efficient operation of rapid-transit trains or cars, that is, that the yard must be located beyond the terminal station. In recent studies for additional rapid-transit facilities, suggestions have been made that terminal yards can be located on the in-town side of the terminal stations. The operating and engineering staffs of the Boston Elevated Railway strongly favor the other plan, on the basis of actual experience when the yard at Forest Hills was located on the in-town side of Forest Hills Station.

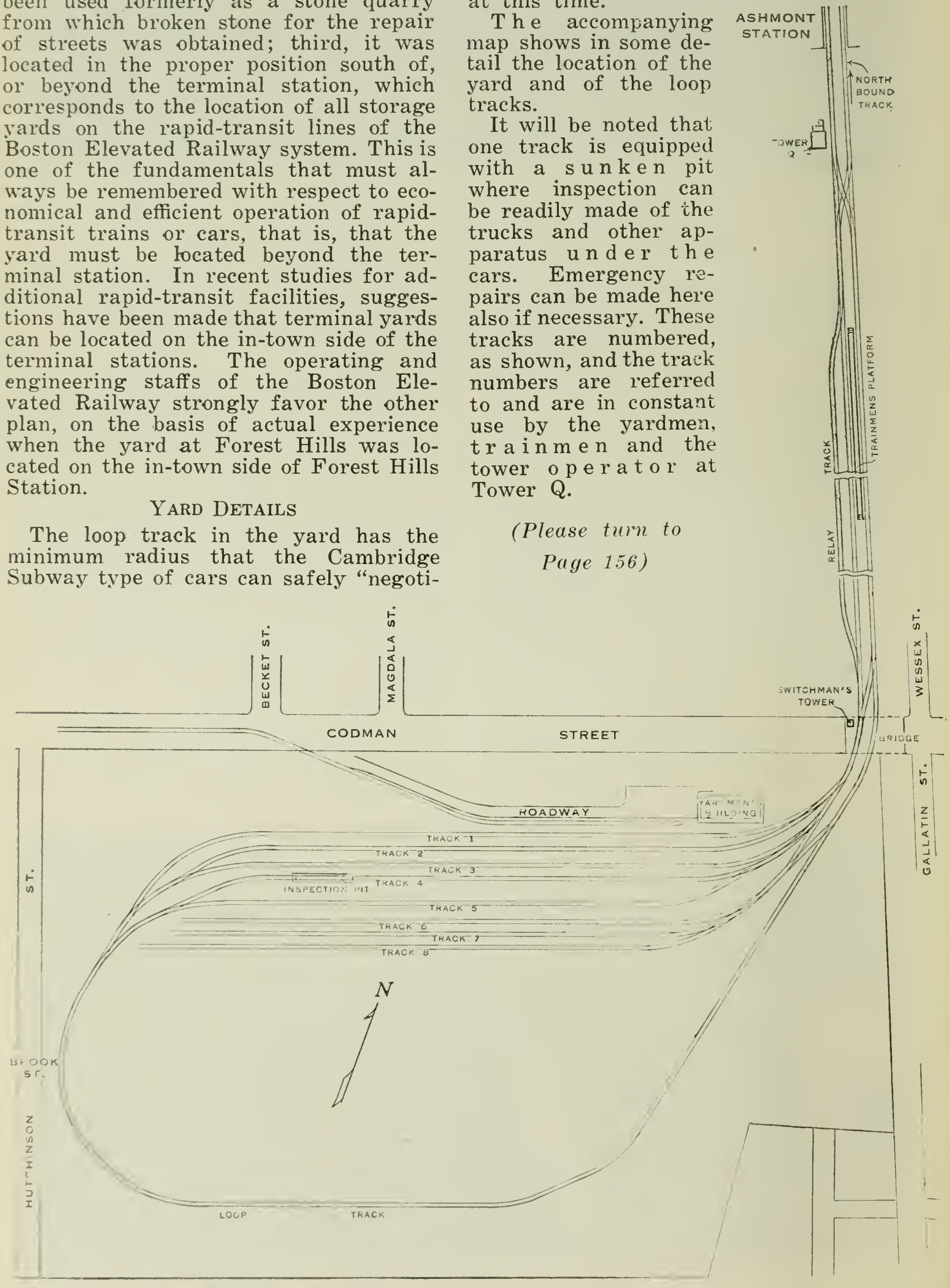
Yard Details

The loop track in the yard has the minimum radius that the Cambridge Subway type of cars can safely "negotiate." The establishment of a loop track requires a very large area and at the present time the interior of the loop is not entirely occupied by storage tracks. Only sufficient tracks have been installed to take care of about sixty cars, which storage space, in the opinion of the transportation department, is sufficient at this time.

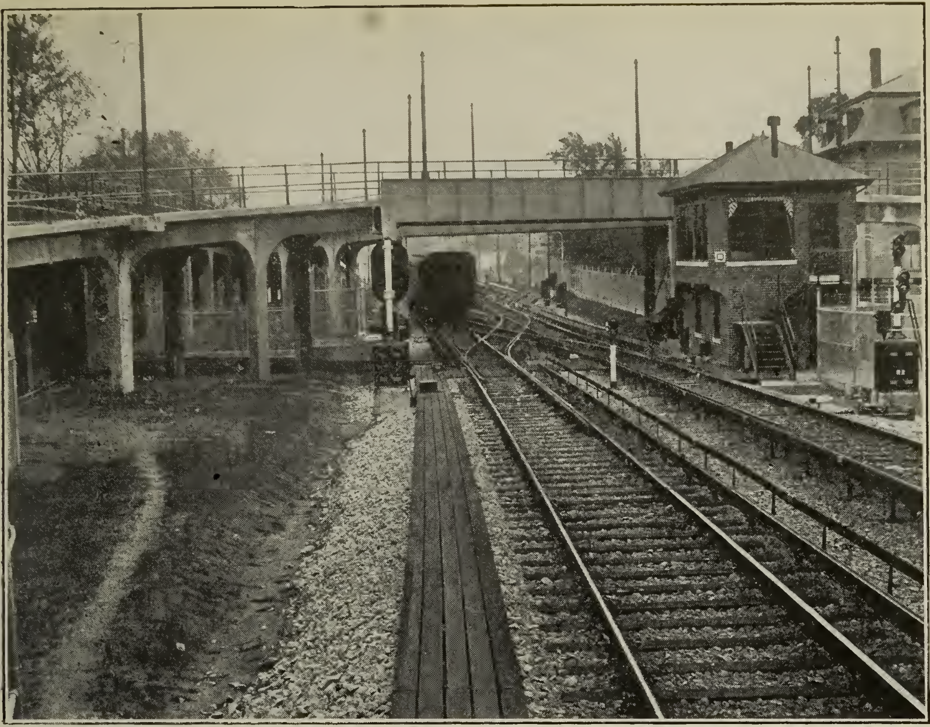
The accompanying map shows in some detail the location of the yard and of the loop tracks.

It will be noted that one track is equipped with a sunken pit where inspection can be readily made of the trucks and other apparatus under the cars. Emergency repairs can be made here also if necessary. These tracks are numbered, as shown, and the track numbers are referred to and are in constant use by the yardmen, trainmen and the tower operator at Tower Q.

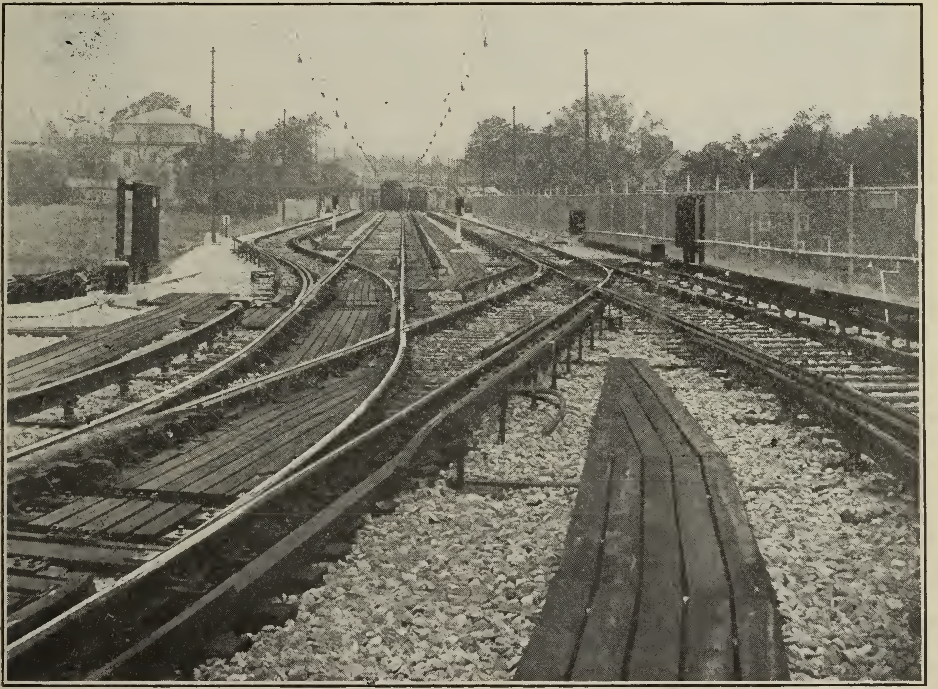
(Please turn to Page 156)



A General Plan of Codman Street Yard and Track Layout



View Along Track from Ashmont Station, Showing Interlocking Tower



Looking North from Yard Along Trainmen's Platform and Relay Track

HOW TO STUDY*—I

By Special Arrangement With Author and Publisher Permission Has Been Secured to Reprint for the Benefit of "El" Employees This Helpful Paper by a Teacher and Engineer of Wide Experience and Reputation

By GEORGE FILLMORE SWAIN, LL.D.
Professor of Civil Engineering, Harvard University

> "For the end of education and training is to help nature to her perfection in the complete development of all the various powers."
> —*Richard Mulcaster,* 1522-1611.

EDUCATION is an opportunity, nothing more. It will not guarantee success, or happiness, or contentment, or riches. Everything depends upon what development is produced by it and what use is made of it. It does not mean morality or usefulness. It may make a man more capable of doing harm in the world, for an educated scoundrel is clearly more dangerous than an ignorant one. Properly employed, however, and combined with high character, with a due regard for the rights of others, and with simple and practicable but high ideals, it should help a man very greatly in making himself of service in the world and so in making his life really successful in the highest sense. What the student gets out of his education depends largely upon what he puts into it. The student is not an empty vessel to be pumped full of learning; he is a complex machine which education should help to run properly.

The aim of education is purely utilitarian, and is expressed more clearly by the word *power* than by any other. Its object is to give the man power to meet the problems of life, and to develop all his faculties to the greatest degree. The word "utilitarian," however, is to be interpreted in its broadest sense. It is not simply bread-and-butter utility that is aimed at. Whatever makes a man more capable of legitimate enjoyment, or helps to make him contented and happy, or to enlarge his breadth of view, is really useful and helps to give him power. "The true order of learning should be first, what is necessary; second, what is useful; and third, what is ornamental. To reverse this arrangement is like beginning to build at the top of the edifice."

The only way that power and strength can be developed is by effort on the part of the student. The only real education is self-education. The best that the teacher can do for the student is to show him what he can do for himself and how he can do it.

"If little labor, little are our gains;
Man's fortunes are according to his pains."

But labor alone will not produce gains unless properly and intelligently directed. Misdirected labor, though honest and well-intentioned, may lead to naught; just as any virtue, such for instance, as perseverance, if misdirected or misapplied, or in the wrong proportion, may become a vice. Hegel's dictum that anything carried to its extreme tends to become its opposite, has profound significance. A student may work hard and earnestly in school or college and yet accomplish little or nothing. He should, therefore, be made to see—not only the necessity for hard work. and how to work—but also how to work *effectively.*

Among the most important things, then, for a student to learn, is how to study. Without a knowledge of this his labor may be largely in vain. He may pass his examinations and yet know nothing thoroughly and have little power. The importance of knowing how to study is evident when we realize that the amount of knowledge that a student can acquire in college, compared with the whole mass of human knowledge, even that bearing upon a single specialty, is entirely insignificant; and furthermore, that a student is generally quite unable to foresee with any degree of correctness what his work in life will be. Unless, therefore, his education has enabled him to take up a new subject or a new problem and to study and master it himself—that is to say, unless he has learned how to study, how to use his mind properly and to direct it efficiently upon the subject in hand—his education may have benefited him little and may not have fitted him for the career in which he finally finds himself.

Important as it is to learn how to study, it is singular that most students do not learn it, and that little effort is

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made to teach it. It is assumed that children know how to study because they have brains. Probably a large majority of our college graduates today have not learned how to study properly, and find it difficult or impossible to take up a new study and master it. They have only learned how to do certain routine things in a mechanical way. They have learned by rote.

It is with the hope of emphasizing this subject and of calling attention to some rules for proper study, that this article has been written.

In its broadest sense, the question to be considered is, "How to Investigate a Problem." In doing this the first step is to get together all available information regarding the problem, including books, experimental data and results of experience, and to consider and digest this material. Personal investigations and inquiry, further experimental research, correspondence, travel, etc., may then be necessary. This will be based, however, in general, upon a study of books, and with this part of the subject we are here particularly concerned.

Let us, therefore, consider the elements requisite for a proper method of study.

THE PROPER MENTAL ATTITUDE

The first essential is that *the student should have the proper mental attitude.* That attitude should not be one of subservience, of blind believing, but should be one of mental courage and determination. His object is to understand the subject, not simply to read a book. If the book is a proper one for him to read, that is to say, if he has the proper preparation, and requisite mental power, then he is capable of mastering it. He is to master the book, the book is not to master him. He is to learn what the writer of the book thinks in matters of opinion, but he is never to accept such views blindly, and is to believe them only when he sees them to be true. Many students accept blindly as truth whatever they see on a printed page that they are required to read. To do this, even if what is read be remembered, is to study by rote; it makes a routine, rule-of-thumb man, who merely imitates or copies. He should realize that nothing is true simply because it is in a book, but should accept it only when it passes the test of his own understanding. Mental courage, therefore, is essential for a proper method of study, without which the student will become little more than a parrot. He must possess self-confidence, a consciousness of his power to master the subject, and a firm determination to master it. Of course, nobody should read a book that he is incapable of mastering or unprepared to understand. A suitable preparation and sufficient mental power are of course essential, and are here assumed. The point is that the sense of his own power and the determination to use it should be constantly in his mind.

Students are of course frequently, if not generally, limited in the time which they have available for any given lesson, and they may not be able to follow out completely the methods recommended in this paper. It may therefore be necessary for a student frequently to accept a statement which he reads, although he is not at the time able to see the reason for it. In all cases, however, he should endeavor to perceive whether it is a mere fact or definition, or whether it has a reason, and if he cannot at the time understand the reason he should accept the statement only tentatively, making a note of it as something which he must return to and study further if he wishes thoroughly to master the subject.

THE STUDENT MUST DISTINGUISH CLEARLY BETWEEN READING AND UNDERSTANDING

Reading alone, no matter how extensive, or how retentive the memory, will not give wisdom or power.

"Who reads
Incessantly, and to his readings brings not
A spirit and judgment equal or superior
Uncertain and unsettled still remains,
Deep versed in books, and shallow in himself."

No doubt every one finds himself at times reading merely words or phrases without understanding them, reflecting about them, or translating them into terms which are intelligible to his understanding. Such reading is worse than useless; it leads to actual mental injury. Whenever we find ourselves doing this we should therefore arouse ourselves, make an effort of will, and concentrate our attention upon the subject, insisting upon understanding it. If for any reason we are unable to do this, we should close the book, take some exercise or recreation, or at any rate do something else, for we are not at the moment fitted for study. We might as well eat sawdust and deceive ourselves with thinking that we are taking nourishment. It is not what is read or what is remembered. but only what is understood, that gives power.

"In this quest of knowledge . . . there are two faults to be shunned—one, the taking of unknown things for known, and giving an assent to them too hastily, which fault he who wishes to escape (and all ought so to wish) will give time and diligence to reflect on the subjects proposed for his consideration. The other fault is that some bestow too great zeal and too much labor on things obscure and difficult, and at the same time useless."—*Cicero.*

THE STUDENT MUST CLEARLY DISTINGUISH MERE FACTS FROM CONCLUSIONS OR OPINIONS

Mere facts, some of which may be the result of laborious investigation, may be accepted without verification, if the authority is good. When the student reads that the river Nile rises in Equatorial Africa, flows in a northerly direction through Egypt into the Mediterranean sea, he cannot verify this statement nor reason out that it must be so. It is a mere fact and a name, and he simply accepts it, perhaps looking at the map to fix the fact in his mind. So, too, if he reads that the atomic weight of oxygen is 16, or that a cubic foot of water weighs 62.4 pounds, he cannot be expected to perform the experiments necessary to verify these statements. If he were to do this throughout his reading, he would have to make all the investigations made in the subject since man has studied it, taking no advantage of the labor of others.

Very different are conclusions or opinions deduced from facts; and logical conclusions are very different from mere opinions. The facts may be sufficient to prove logically a certain conclusion. On the other hand, the facts may simply give reasonable ground, or appear to give reasonable ground, for a certain opinion, though they may fall far short of demonstration. The student must, therefore, discriminate constantly between mere statements of facts, necessary conclusions which follow therefrom, and mere opinions which they seem to render reasonable.

Some conclusions also, like those of mathematics or logic, may be arrived at by the unaided reason without the previous accumulation of facts deduced from experiments or observation. Such truths or conclusions should be distinguished from those which are based upon facts, experiments or observation. If the student reads, therefore, that the sum of the angles of a plane triangle is equal to two right angles, he should see that this is not a mere fact, but an inevitable truth, the reason for which he should perceive, and not accept simply because he reads it.

The continual exercise of this discrimination, which comes from an attitude of mental courage and independence, is an essential of proper study.

THE STUDENT'S MIND SHOULD BE A CONTINUAL INTERROGATION POINT.[1]

He should always ask himself, regarding any statement which he reads, whether there is a reason for it, and if there is, whether it is inherent in the nature of things, so that he might independently arrive at it, or whether it follows from facts which the writer has observed. For instance, there is at first sight no reason why a cubic foot of water should weigh 62.4 pounds. It simply does and that is all there is to it; it does, because it does. But if he reads that a cubic foot of water at one point on the earth's surface weighs less than it does at another point, or that in the Northern Hemisphere the wind in a storm revolves around the storm center in a direction contrary to the motion of the hands of a clock, he should perceive that these facts, if true, have a reason for them, and he should endeavor to perceive that reason.

It must be observed at this point that, strictly speaking, there must be a reason for any truth, even for what we may term mere facts, excepting those which

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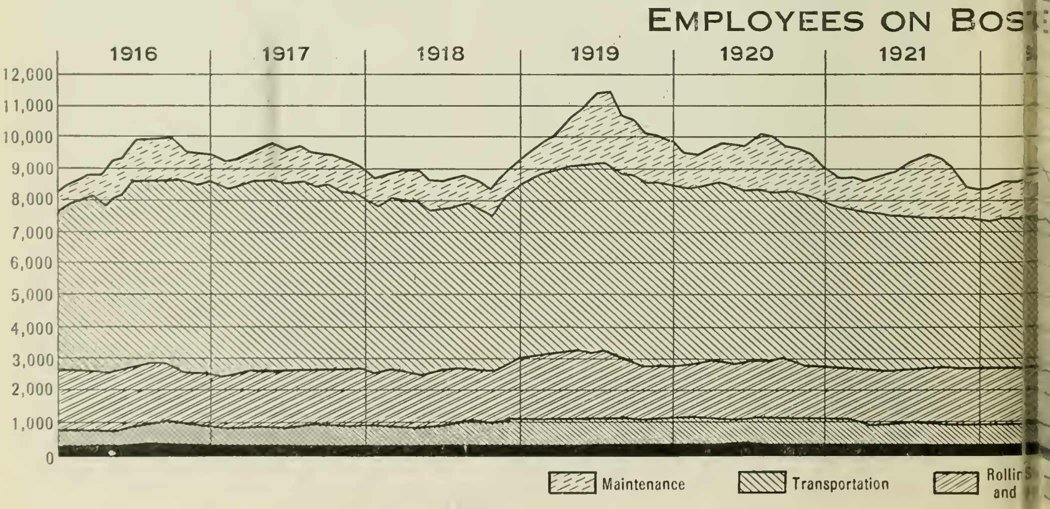
[1] "He that questioneth much shall learn much."—**Bacon.**



are mere definitions. There is some reason, lying in the constitution and arrangement of its atoms, why a cubic foot of water at a given spot and at a given temperature weighs 62.4 pounds. But there is no reason why New York is 90 miles from Philadelphia; those two points 90 miles apart are simply so named or defined. Many truths which are accepted as mere facts, the explanation being unknown, in the course of time are explained by the progress of science. Thus, for many years the fact that a magnetic needle pointed toward the North was a mere unexplained fact, but later the reason was discovered. The same is true of the fact that the pollution of drinking water by sewage may cause typhoid fever. The point is that the student must continually discriminate, continually inquire, and, as he reads, keep a list of points, the reason for which he cannot then discover, but which he perceives must have a discoverable reason. He should not go too deeply into this, but should preserve his sense of proportion; for if he follows every possible line of inquiry back to its source he will progress but slowly. Thus, if he is studying descriptive astronomy and reads that the sun is ninety-two million miles from the earth, or that Jupiter has nine moons, or that the star Sirius is moving away from the earth with a velocity of eleven miles per second, or that the moon always turns the same half toward the earth, he should perceive that he cannot at that stage try to get back of these facts, but he may well make a note of them as questions to be later examined, if not as to the cause, at least as to how the fact is ascertained.

It does not follow that he should never leave the subject until he has found a reason, for it may depend upon facts or

(Please turn to Page 157)

ELEVATED FURNISHES STEADY JOBS

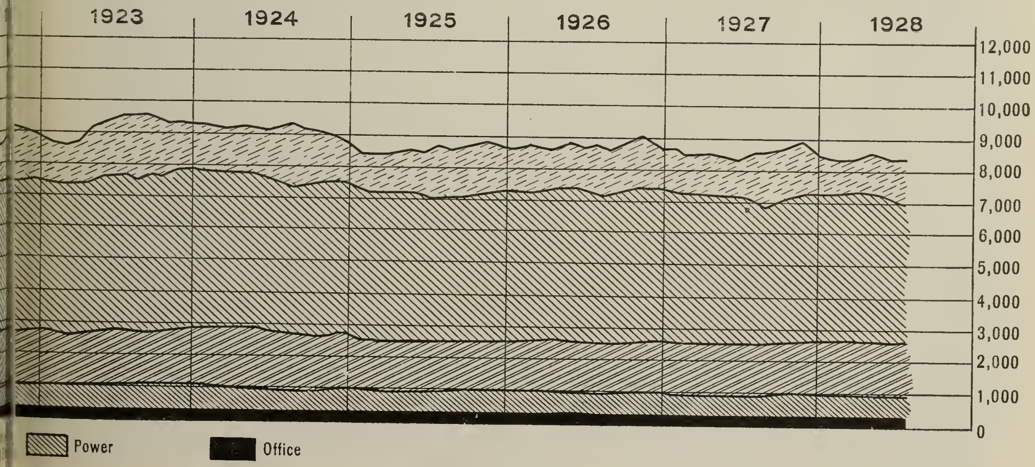
Have you ever stopped to think about the Boston Elevated family, as to size, distribution among departments, permanence, etc.? Whether you have done so or not, the diagram below will interest you. It shows unmistakably that the personnel of the railway is almost constant in numbers. There is bound to be some variation due to certain seasonal construction jobs, particularly in maintenance work. The transportation department also has a small element of flucuation with the density of traffic, On the whole, however, the fluctuation amounts to but a few hundred, a small percentage of the total.

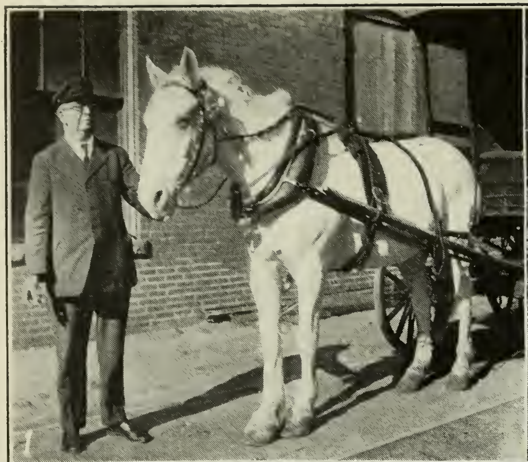
This is all in marked contrast with the manufacturing and building industries, which are greatly affected by seasonal conditions, the general state of business and other disturbing factors.

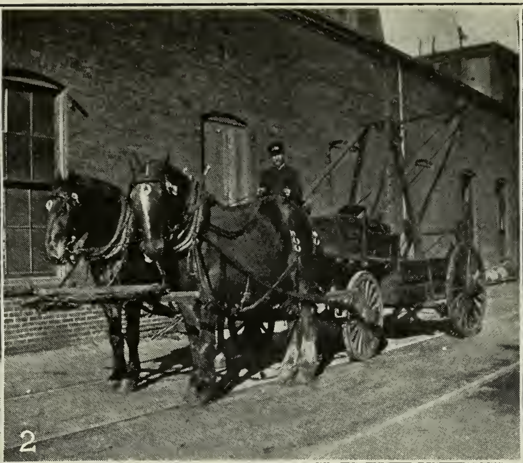
For the past four years the fluctuation above and below an average of about 8,500 employees has been very slight. Before that the variation was greater, especially around war time. During the war period the railway had to be operated on a minimum schedule. From 1916 to 1918 the number of employees fell from just under 10,000 to under 8,500. This was a low figure for the time because the road was not operating with the present efficiency of employee power.

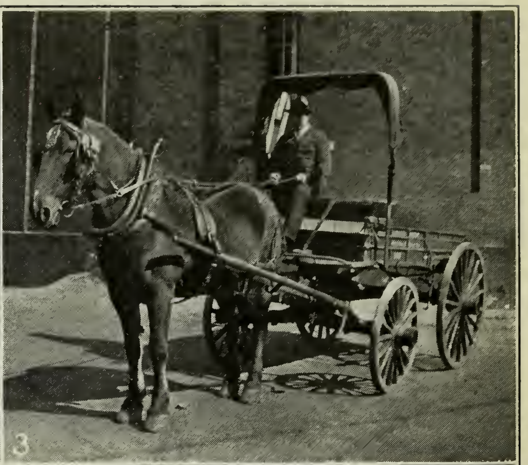
Then the end of the war came and it was necessary to make up for lost time. The payrolls increased as employees came back from the war, and deferred maintenace work was inaugurated. Nearly 11,500 men and women were on the payrolls in the summer of 1919. But it took years to catch up. The humps in the line for the summer periods for five years from 1919 indicate strenuous maintenance and development activity.

ELEVATED PAYROLL









SOME FAITHFUL WORK HORSES AND THEIR DRIVERS

1. Wm. Norton with "Nick" and purchasing department wagon. 2. A. Blake, with "Tony" and "Turk" and power department derrick wagon. 3. J. Cushing, with "Dandy" and supply wagon. 4. W. Dowd, with "Don" and sand wagon. 5. J. Sullivan, with "Jim" and tool wagon.

ELEVATED CLOSE-UPS

The Last Railway Horses

(See Illustration on Front Cover)

NO longer will the familiar sight of a tip cart, express wagon or other vehicle bearing the name "Boston Elevated Railway" and drawn by sleek-looking horses be seen on the streets of Boston, for on Oct. 13, 1928, the last of the horses owned by the Railway, twenty-three in number, were replaced by motor vehicles. This, of course, is no surprise to anyone, because, just as electric cars replaced the old horse cars in providing quicker and more economical transportation for passengers, the motor vehicle has made it possible to transport materials more rapidly and economically.

Most of the men who have recently been awarded gold emblems denoting their long service with the Railway have seen the entire transition from horse-drawn equipment to electric and gasoline-operated equipment.

When the West End Street Railway was organized in 1887, to take over the operation of the many independent horse-car lines operated in and about Boston, 7,728 horses were required to haul the cars and other railway equipment. These horses had a value of $1,035,552. They were housed in thirty-seven separate stables. As the lines were gradually electrified, the number of horses was correspondingly reduced, so that when the last horse-car line was abandoned in 1900 the Railway owned only 487 horses.

Electric cars for the transportation of rails, sand, coal and other material came into use, with the result that in 1915 the Railway owned but 230 horses. It could readily be seen that it was only a question of time when the horses would be entirely displaced and for that reason no horses have been bought by the Railway since 1918, when two were purchased. It has been the practice to allow the horses to continue at work until they were no longer fit for the Railway's service and then have them either humanely destroyed or "pensioned off" on some farm owned by a reputable employee, where they would be assured of proper care and treatment for the remainder of their days.

The first large-scale adoption of motor vehicles went into effect in 1920 in the miscellaneous departments, when forty trucks and passenger cars were purchased for the use of emergency crews, for switch repair trucks, and for the convenience of trackmasters and other subordinate officials. Each vehicle replaced two or more horses. This practice was continued, with the result that in 1927 only twenty-three horses remained, and all the stables were closed, except the one at Lenox street where these horses were quartered.

Great pride has always been taken by the Railway personnel in the appearance and condition of its horses, particularly by the stable foremen and teamsters. Ever since the Boston Work Horse Relief Association has held its annual competition for work horses the Railway has been well represented and generally has been awarded blue ribbons.

In 1926, the last year the Railway was represented, five horses were entered, all of them over 15 years old. In this event gold and silver medals were also awarded to veteran teamsters.

The picture on the front cover of this issue of "Co-operation" shows horses Tom and Jerry, aged 19 and 21 years respectively. Driving them was teamster Amos Rose, of the maintenance department, who has been employed by the Railway since 1905 and is the oldest teamster in active service.

PUBLIC-SPEAKING COURSE

This course is intended to furnish instruction and practice in (a) The oral presentation of a subject to an audience; (b) Argumentation and debate; (c) Parliamentary procedure.

In addition to the instruction to be given by Mr. Edward A. Sullivan of the Rindge Technical School, H. Ware Barnum, Esq., and John T. Hughes, Esq., have each consented to give a short talk in connection with this course, Mr. Barnum on Parliamentary Law and Procedure, Mr. Hughes on Oratory and Argumentation, and it is hoped that other speakers of experience will be secured to give talks on other topics.

Suppose you are called upon to preside over a meeting. Early in a debate several impatient persons call out "Question," "Question." What is then your duty as presiding officer?

Again, suppose you are speaking from the floor of a meeting, and before you have finished your remarks another member of the meeting moves that the whole matter under discussion be laid on the table. Have you and your remarks any rights which the chairman of the meeting is bound to protect?

(Please turn to Page 159)

SUPERVISORS OPEN SECOND SEASON

Good fellowship and entertainment were the features of the opening meeting for the season of the Boston Elevated Railway Supervisors' Association, attended by 200 or more members. The newly constituted board of control, with J. P. Banks as president, had charge of the meeting. Mr. Banks presented his resignation as president, explaining that his new duties as superintendent of Div. 1 will require his undivided attention. He announced the election, by the board of control, of P. E. Maw as his successor. A resolution of appreciation and congratulation to Mr. Banks was passed with enthusiasm. Mr. Maw appointed Wm. J. Carney, supervisor Div. 4, to succeed him on the board of control.

The meeting approved changes in the by-laws as follows:

1. Making any member in good standing who is placed on the railway pension roll a life member without further payment of dues.
2. Changing the annual meeting from May to April.
3. Providing dual nominating committees, one of four members, representing respectively the four operating departments, to be appointed by the board of control at the meeting immediately preceding the annual meeting; and another committee of four members, representing respectively the same departments, to be elected by caucus from the floor at the same meeting. These two committees are to meet and act separately in preparing lists of nominations, which are to be mailed to all members in good standing with the notice of the annual meeting. It is unlerstood that the office of president shall rotate among the four departments.

A resolution was passed favoring the public introduction to the whole body of a number of members at each meeting, so as gradually to bring about the realization of the association slogan "Get Acquainted." Another resolution favored the formation of an association orchestra if sufficient musical talent proves to be available.

ENTERTAINMENT PROGRAM

Following the business session an excellent program of music, monologue and sleight of hand was presented. The entertainers succeeded in getting a good response from the audience in community singing.

NEXT MEETING NOV. 14

The next meeting will be held on Wednesday, Nov. 14. A program of brief talks by men who attended the Cleveland A. E. R. A. Convention is being arranged.

CODMAN STREET YARD

(Concluded from Page 148)

A USEFUL BUILDING IN THE YARD

At the entrance to the yard, on the right-hand side as the trains enter it, is a one-story brick and concrete building 65 feet, 8 inches long and 26 feet, 2 inches wide. It is divided into three parts. The part at the east end is used by the yardmen of the transportation department; the middle section is used by the department of rolling-stock and shops, which will keep here certain ma-

BOARD OF CONTROL, BOSTON ELEVATED RAILWAY SUPERVISORS' ASSOCIATION, 1928-29

Standing, left to right: J. M. Patten, rolling-stock and shops; C. H. Dey, power; M. J. Curtin, maintenance; P. E. Maw, transportation.

Sitting, left to right: J. L. Troy, secretary-treasurer, transportation; Thomas Kivell, vice-president, maintenance; J. P. Banks, president,* transportation; E. L. Doyle, vice-president, power; J. E. Smillie, vice-president, rolling-stock and shops.

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*Since this picture was taken Mr. Banks has resigned as president, and Mr. Maw has succeeded him. W. J. Carney has been elected to fill the vacancy in the Board of Control.

terial and tools for inspecting and making repairs to cars; and the west portion has been turned over to the maintenance department for the use of trackwalkers, signal men, and others. The maintenance section will be used in winter for the use of additional men sent to the yard to remove snow and keep the switches open during snow storms.

The building is equipped with ample toilets and washing facilities. It will be heated by steam, the heating plant being located in the basement at the west end.

Service Track

From Dorchester avenue to the Codman Street Yard, a track has been installed in the center of the Southern Artery, leading into the Codman Street Yard, parallel to track No. 1, and terminating near the yardmen's building. Alongside this track is a driveway which minating near the yardmen's building. terial to, or taking it away from the yard or the yardmen's building.

A Complete Yard Signal System

There is a system of inter-communication connecting Tower Q, the yardmen's building, and a small switchman's booth located near the Southern Artery Bridge. This is very complete, the three locations being connected with both main-line and intercommunicating telephones, call bells and a special annunciator system. Bell signals are used by the towerman in calling upon the yard force to put a relay train into road service, in notifying them when a road train is to be removed from service, etc. The annunciator is used by the yardmen to notify the towerman of required routes to be set up for train movements through the interlocking.

Telephones are. of course, used for securing and transmitting a variety of information, where greater detail is necessary than can be given by bell code or annunciators.

The annunciator in use was especially designed. It consists of push-button controls and miniature lights at both the yard building and switchman's booth, and with miniature indicating lights, cancelling buttons and buzzer at Tower Q. In calling for a route to be set up, the yardman pushes the button at either the yardmen's building or the switchman's booth. This call is indicated at Tower Q by both the light and audible signal. The corresponding light is also displayed at the originating point and continues to show until the route has been set and train movement made, after which it is cancalled by the towerman. By this method, accuracy on the part of both men is required. As both men have the indication of what was called for, disputes are avoided.

NORTH STATION CHANGES

On Saturday, Oct. 6, the first of the new stairways from the new Boston and Maine station to the Boston Elevated viaduct platform was opened for the use of passengers. On Saturday, Oct. 20, the entrance from the north end of North Station direct to the Causeway Street entrance of the Elevated was also opened.

NEW RAPID-TRANSIT RULE BOOK

The Rapid Transit Lines division has just issued a new rule book for trainmen and other employees. The previous rule book was issued in 1918 since when there have been many changes in practices, necessitating revision of a number of the rules. All employees on the Rapid Transit Lines and officials of other departments have been supplied with copies of the new book. A careful reading of the book is commended to all employees who have received copies.

An introduction, signed by Mr. Dana, is as follows:

> The rules contained herein have been adopted for the government of all officials and employees engaged in the operation of Rapid Transit Lines.
>
> To enter or remain in service is an assurance of willingness to obey the rules, and the judgment of the Railway by the public is measured largely by the impression which your conduct conveys.
>
> The efficient conduct of the business and the protection and safety of both employees and the public depend upon compliance with these rules.

HOW TO STUDY

(Concluded from Page 153)

principles of which he is not at the moment informed; but if such is the case, he should accept the fact tentatively, but make a mental note that it is something which clearly must have a reason which he is capable of perceiving, and which he will look up at some future time. In studying his book he may well make a list of such questions to ask the teacher or to look up later.

Students must of course proceed in a systematic way, and a student who has not studied physics cannot be expected to perceive reasons that depend upon the laws of physics, and yet without a knowledge of physics he may still perceive that a statement is not of a mere fact, but of something that must have a reason. To primitive peoples nature was a closed book.

EDUCATIONAL CALENDAR FOR NOVEMBER

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1 Arts and Crafts	2 Maintenance Group Conference H. M. Steward, Speaker 1st-Year Foreman Conferences	3
4	5	6 **Election Day**	7 Public Speaking 4th - Year Foreman Conferences Selling Car Rides	8 Motor Vehicles Capt. George A. Parker, Registrar of Motor Vehicles, Speaker Arts and Crafts	9 2nd-Year Foreman Conferences	10
11 **Armistice Day**	12	13 Correct English	14 Evening open for Supervisors' Association	15 Law for Everybody C. W. Mulcahy, Speaker Arts and Crafts	16 3d-Year Foreman Conferences 1st-Year Foreman Conferences	17
18	19 General Meeting of All Groups L. S. Storrs, Speaker	20 Correct English	21 R. S. & S. Group Conference Selling Car Rides	22 Motor Vehicles Arts and Crafts	23 2nd-Year Foreman Conferences	24
25	26 Public Speaking 4th Year Foreman Conferences	27 Correct English	28 Transportation Group Conferences	29 **Thanksgiving Day**	30 1st-Year Foreman Conferences	

PUBLIC-SPEAKING COURSE

(Concluded from Page 155)

These and other questions will be covered by this course, so that the members may have some understanding of what are the *Duties of the Chair,* and the *Rights of the Floor.*

First meeting, Wednesday, November 7, 1928. Other meetings on Mondays.

BRIEF OUTLINE OF EVERYDAY LAW COURSE, 1928-9

1—Thursday, Nov. 15, 1928.

Charles W. Mulcahy, Esq., Corporations.

(a) What is a corporation? (b) Business, how conducted. (c) Directors' powers and liability. (c) Stockholders' rights and liability. (e) Validity of contracts. (f) Liability for accidents.

2—Thursday, Dec. 13, 1928.

H. Ware Barnum, Esq., General Counsel. The Law of Suretyship.

(a) What is a surety and suretyship? (b) How is the relationship created? (c) Responsibility of one who goes on another's bond. (d) Surety companies. (e) Rights of a surety. (f) Circumstances under which a surety escapes being held responsible.

3—Thursday, Jan. 3, 1929.

Henry S. MacPherson, Esq., Railroads and Railways.

(a) Duty to public. (b) Duty to passengers. (c) Liability for accidents.

4—Thursday, Jan. 17, 1929.

John W. Cronin, Esq., Insurance.

(a) Liability. (b) Workmen's Compensation. (c) Fire. (d) Compulsory automobile. (e) Accident.

5—Thursday, Jan. 31, 1929.

Charles S. Walkup, Jr., Esq., The Law of Partnership.

(a) What constitutes partnership? (b) Silent partners. (c) Limited partnerships. (d) Liability of partner for acts of other partners. (e) When may one be held to a partner's liability without having realized he was a partner?

6—Thursday, Feb. 14, 1929.

Hon. Russell A. Sears, General Claims Attorney. The Law and the Automobile.

(a) Early method of transportation. (b) Advent of automobile. (c) Benefits and burdens of the new vehicle. (d) Complexity of situation. (e) Law and ethics governing owner, driver and general public.

7—Thursday, Feb. 28, 1929.

Arthur F. Bickford, Esq., Jury Trials.

(a) Investigating of facts. (b) Preparation for trial. (1) Examination of law. (2) Examination of witnesses. (c) The trial. (1) Selection of jury. (2) Conduct of trial. (d) Psychology of a jury trial.

8—Thursday, March 14, 1929.

Samuel P. Sears, Esq., The Law of Evidence.

(a) First-hand knowledge as distinguished from hearsay. (b) Things seen or heard as contrasted with inferences. (c) Facts versus opinions. (d) Original documents versus copies. (e) Written agreements versus verbal understandings. (f) Testimony versus argument.

9—Thursday, March 28, 1929.

Charles B. Gleason, Esq., The Law of Agency.

(a) Agents or independent contractors. (b) Liability for acts of one's "ostensible agent." (c) Agent's power to receive payment of money. (d) Agent acting without disclosing that he is an agent. (e) Liability for agent's negligence. (f) Liability of agent exceeding his authority.

10—Thursday, Apr. 11, 1929.

John E. Hannigan, Esq., The Law of Damages in Personal Injury Cases.

(a) Lost time. (b) Expense. (c) Mental and physical pain. (d) What risk a man takes who is careless.

Afternoon session at 5.15 at Franklin Union, 41 Berkeley Street.

Evening session at 7.45 in class room at Dudley Street Terminal.

Those interested who have not already registered should do so at once.

BOSTON ELEVATED RAILWAY COMMITTEE ON EDUCATION, 1928-29

Standing, left to right: H. H. Norris, educational advisor; W. H. Burrell, power; E. M. Brooks, legal; Edward Dana, general manager; F. W. Amadon, bureau of audit; J. P. Banks, transportation; A. A. Ordway, rolling-stock and shops.

Sitting, left to right: D. J. Prendergast, treasury; A. F. McNaughton, purchasing; Miss Esther McMenimen, women's interests; J. J. Reynolds, claims; W. H. Barnes, maintenance.

CHANGES IN THE RESERVE FUND

Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*	Jan.	$191,381.71†
Aug.	408,570.65*	Feb.	75,469.39†
Sept.	147,204.65*	Mar.	159,985.97†
Oct.	79,421.50†	April	43,542.45†
Nov.	34,226.52†	May	93,645.42†
Dec.	280,536.75†	June	179,790.77†

Profit and loss credit.....$666,500.98

Fiscal Year 1928-29

July 1, 1928, $1,000,000

July	$331,329.58*
Aug.	398,356.82*
Sept.	204,840.30*

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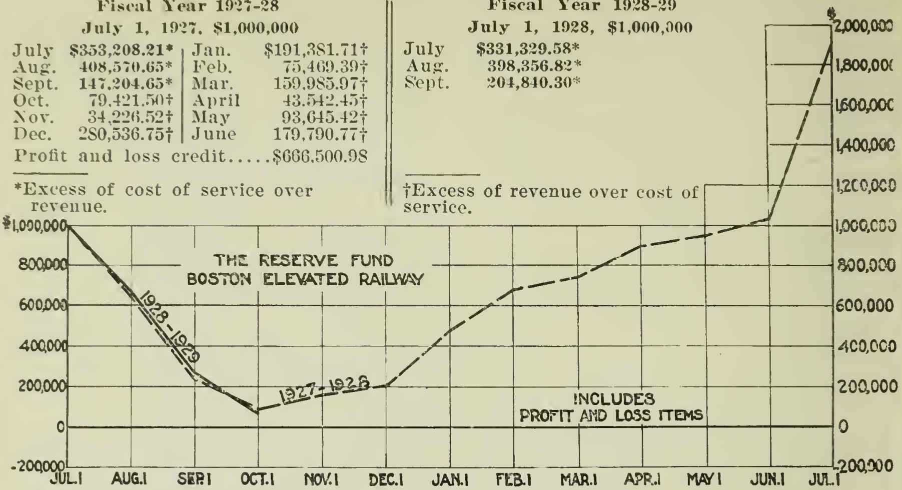
*Excess of cost of service over revenue.

†Excess of revenue over cost of service.



SEPTEMBER OPERATION

GENERAL FINANCIAL DATA	1928	1927
Cost of service exceeded revenue	$204,840.30	$147,204.65
Operating revenue per car-hour (A.E.R.A. std.)	$5.87	$6.08
Operating revenue per car-mile operated	58.45c	61.44c
Average fare per revenue passenger	9.330c	9.303c
Ratio operating expense to operating revenue	77.21%	75.65%
PASSENGERS CARRIED		
Revenue passengers	27,051,640	27,855,837
Per cent 5c, 6c and 6¼c passengers	17.34%	17.85%
Revenue passengers per car-mile operated	6.078	6.405
OPERATING FACTS		
Trips operated	570,124	565,103
Car-miles operated:		
Rapid-transit lines	1,282,491	1,122,357
Surface, two-man	1,373,118	1,599,920
Surface, one-man	1,306,776	1,185,714
Express, newspaper and sprinkler cars	923	988
Motor bus	487,375	439,929
Total miles operated	4,450,683	4,348,908
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.68*	2.10*
Accidents per 10,000 bus-miles	2.24*	2.23*
Revenue passengers carried per accident	18,940	18,010
Average number of witnesses per accident	3.16	3.43
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	20	7
Employees complained of by car riders	70	111
Car defects reported per 10,000 car-miles	3.5	2.9
INFORMATION ABOUT POWER		
D. c. kw.-hr. output gross for month	16,136,720	15,735,700
Maximum kw. load	56,880	54,760
Tons of coal consumed for power	13,596	13,721
Lbs. of coal for power per d.c. kw.-hr. at cars	1.892	1.959
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	1.144c	1.22c
Per revenue car-mile	4.19c	4.42c
Kw.-hr. per revenue car-mile	3.664	3.618

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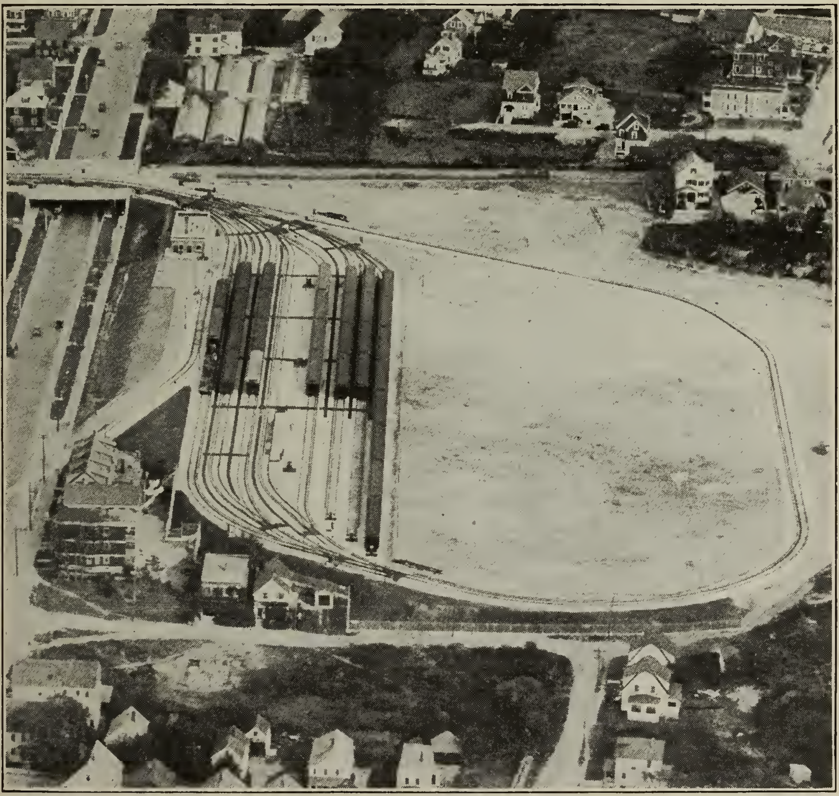
*Does not include miscellaneous accidents or derailments.

October 22, 1928 81 EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY
CO-OPERATION

Volume 7 NOVEMBER, 1928 Number 11



CODMAN STREET YARD FROM THE AIR

(See also pages 168, 169 and 175)

To All 'El' Employees

A FEW weeks ago a car operator, when putting up his car after midnight, noted smoke coming from an "El" manhole nearby. Realizing that the smoke probably indicated underground trouble he immediately notified an official who, in turn, through the night clerk, called the wire and conduit division of the power department. A crew was on the job practically immediately and found that a grounded cable was causing water in the manhole to steam. If the trouble had not been discovered promptly the cable would have become short-circuited and considerable delay to service might have resulted.

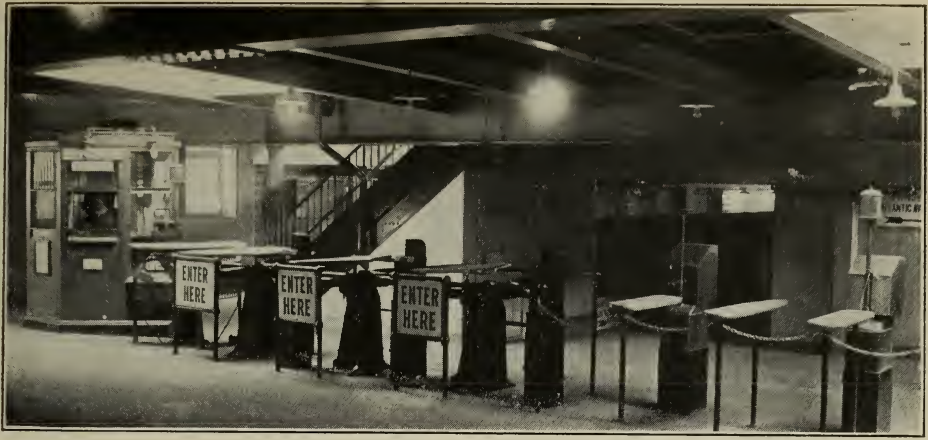
This incident illustrates the interest in the reliability of the service which a large majority of the "El" employees have and which should be universal over the system. The trite old saying "a stitch in time saves nine" applies most aptly in the electric railway business.

We aim to sell dependable service. Every possible means must be taken to keep the service dependable. Delay is not only an inconvenience to the public but is long and unfavorably remembered.

Let's be constantly on the watch for trifles which might, if undetected, produce serious results.

Edward Dana

INTERIOR OF LOBBY OF NORTH STATION PROPER



NEW "EL" DEVELOPMENTS AT NORTH STATION

Completion of Boston "Garden" and New Boston & Maine Terminal Necessitated Enlargement and Other Changes in These "El" Stations: North Station West, North Station Proper and North Station Elevated These Changes Provide for New Traffic Conditions

ON Nov. 14, 1928, the Boston & Maine Railroad formally opened the New North Station to the public. The first events in the Boston Madison Square Garden surmounting the station were boxing bouts, held under the auspices of the Crosscup-Pishon Post, American Legion, on Nov. 17.

For several months the construction department of the Elevated has been actively engaged with changes and improvements on Causeway street occasioned by the erection of the new terminal, over which the "Garden" is located, and the widening of Causeway Street on which the terminal fronts.

"El's" Part Completed in 2½ Months

The work on the station and "Garden" was delayed through various causes. Injunctions were brought against the B. & M., with subsequent hearings. Special legislation had to be passed permitting the B. & M. to erect its new terminal for the purpose intended. The approval of the plans by Department of Public Utilities had to be secured and a mutually satisfactory agreement between the B. & M. and the "El" had to be arrived at. Hence it was not possible to start actual construction work of the "El's" part, until about Sept. 1, 1928. As the railroad requested that all of the Boston Elevated Railway changes be completed by about Nov. 1, it was necessary to divide the work into several classes and to arrange to carry it on simultaneously by the Railway and four contractors.

The contract work was divided into these parts: roofing work; stairs, fences and railings; concrete work, and metal protection on the interior and exterior of the fare collecting lobbies, partitions, etc.

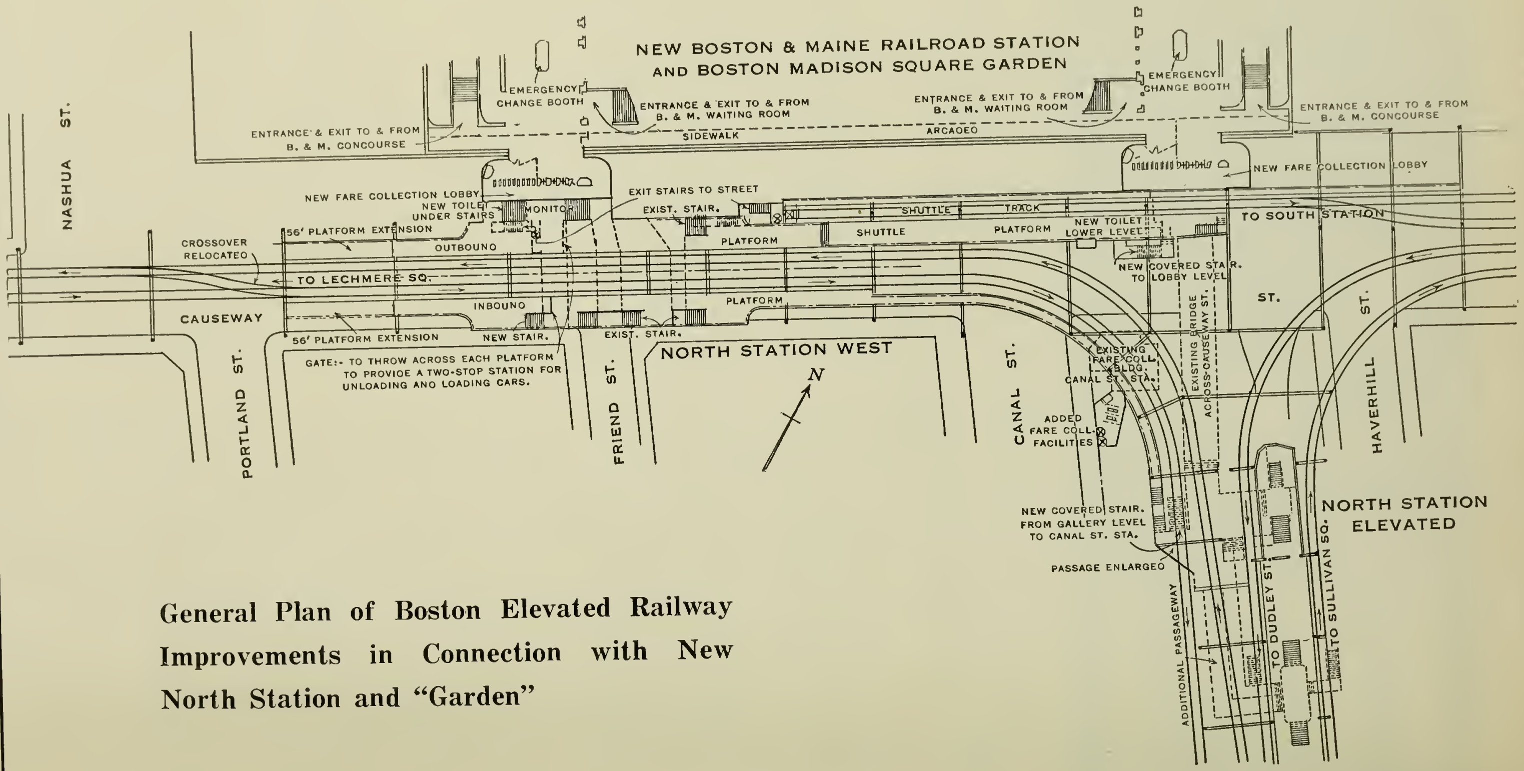
The Railway made all the structural-steel changes, performed all electrical work and carpenter work, and installed fare collecting apparatus, with its own forces, in conjunction with the work of the contractors. The work was carried on with the utmost degree of co-operation, with the result that the Railway was able to complete all of these changes on Nov. 15, 1928.

All of the new work is of substantial construction and as nearly fireproof as possible. The outside is covered with copper and the inside is sheathed with kalamein sheathing which has been painted.

How Causeway Street Was Widened

As stated above, widening of Causeway Street was part of the North Station improvement. It was widened from 50 feet to 85 feet, between Beverly and Nashua streets, without disturbance of the southerly side.

In order to widen the street to 85 feet, the Boston Street-Laying-Out Department decided, after consultation with the railroad, to provide an arcaded sidewalk on the north side. A proposition from the B. & M. was accepted that the front of the new terminal be approximately at the curb line, the sidewalk to be "arcaded" under the second story of the building. This arrangement was necessary to provide room for the auditorium over the station, with adequate


NEW BOSTON & MAINE RAILROAD STATION AND BOSTON MADISON SQUARE GARDEN
EMERGENCY CHANGE BOOTH
EMERGENCY CHANGE BOOTH
ENTRANCE & EXIT TO & FROM B. & M. WAITING ROOM
ENTRANCE & EXIT TO & FROM B. & M. WAITING ROOM
ENTRANCE & EXIT TO & FROM B. & M. CONCOURSE
ENTRANCE & EXIT TO & FROM B. & M. CONCOURSE
SIDEWALK
ARCADED
NEW FARE COLLECTION LOBBY
NEW FARE COLLECTION LOBBY
NEW TOILET UNDER STAIRS
MONITOR
EXIT STAIRS TO STREET
EXIST. STAIR.
SHUTTLE
TRACK
SHUTTLE
PLATFORM
PLATFORM
NEW TOILET LOWER LEVEL
TO SOUTH STATION
NEW COVERED STAIR. TO LOBBY LEVEL
56' PLATFORM EXTENSION
CROSSOVER RELOCATED
OUTBOUND
TO LECHMERE SQ.
INBOUND
PLATFORM
CAUSEWAY
56' PLATFORM EXTENSION
NEW STAIR.
EXIST. STAIR.
GATE:- TO THROW ACROSS EACH PLATFORM TO PROVIDE A TWO-STOP STATION FOR UNLOADING AND LOADING CARS.
NORTH STATION WEST
N
NASHUA ST.
PORTLAND ST.
FRIEND ST.
CANAL ST.
ST.
ST.
HAVERHILL
EXISTING FARE COLL. BLDG. CANAL ST. STA.
ADDED FARE COLL. FACILITIES
EXISTING BRIDGE ACROSS CAUSEWAY ST.
NEW COVERED STAIR. FROM GALLERY LEVEL TO CANAL ST. STA.
PASSAGE ENLARGED
ADDITIONAL PASSAGEWAY
TO DUDLEY ST.
TO SULLIVAN SQ.
NORTH STATION ELEVATED

General Plan of Boston Elevated Railway Improvements in Connection with New North Station and "Garden" space for waiting room, concourse, etc., allowing sufficient length of trackage and platforms between the concourse and the drawbridges over the Charles River, for long trains.

STEPS IN THE "EL'S" SHARE IN THE WORK

The first step taken by the Elevated was to remove the existing connections between its stations and the old Boston & Maine Terminal. Next, temporary stairways, passageways, etc., were provided, so that persons using the "El" stations could still do so in comfort and safety. Then two large fare-collecting lobbies were built, connecting directly with the wide passageways at either end of the auditorium on the second floor level of the Boston & Maine Terminal. At the Haverhill street end, while the bridge across Causeway Street was ample in width, it was necessary: (1) to enlarge the entrance and exit facilities at the Canal Street Station; (2) to provide an additional wide stairway from the ground level at the Canal Street Station to the intermediate level at North Station Proper, and (3) to widen the gallery leading from this stairway to the upper level. The shuttle platform also was increased in width and capacity by removing a stairway and substituting therefor a wider stairway on the back of the platform.

TO MOVE OR NOT TO MOVE THE COLUMNS?

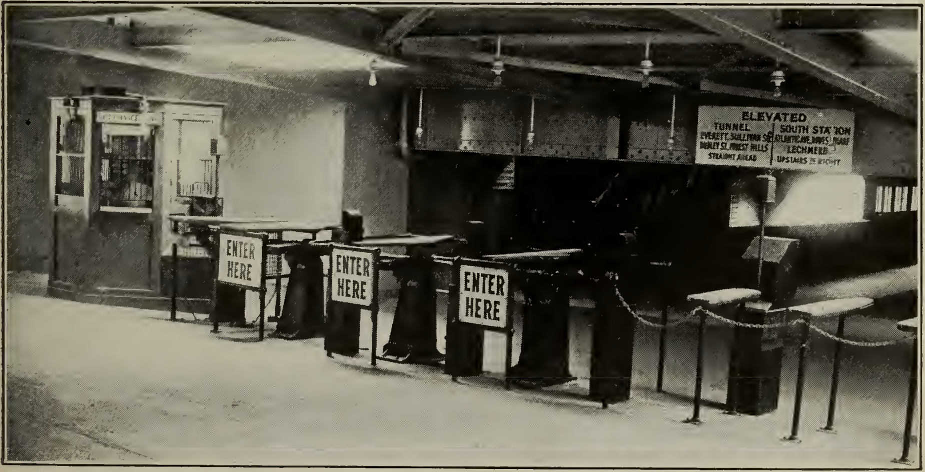
The elevated columns supporting the East Cambridge Viaduct were located just back of the curb lines of Causeway Street. To effect the street widening described above it was necessary either to move the columns on the northerly side of the street at a great expense, or provide an island in approximately the center of the new street around the base of the columns. The latter method was followed, for two reasons: (1) to save the expense of altering the elevated structure and (2) to divide the line of vehicular traffic on Causeway Street. It was necessary, however, to re-locate four columns in Causeway Street between Beverly and Haverhill streets, and further alterations will be necessary in the East Cambridge Viaduct where the new highway connects with Leverett Street near the Charles River Dam. This work is under way.

FARE-COLLECTION LOBBIES ARE COMMODIOUS

Each of the fare-collecting lobbies is arranged to handle up to 720 persons per minute. The width of each lobby parallel with Causeway Street is approximately 64 feet. There are two change booths, and during the time that the auditorium is in use additional means for making change will be provided in one of the booths belonging to the Boston & Maine. For ordinary business only three automatic coin-in-the-slot electric passimeters are required, even in the rush hour. To handle the crowds coming from the auditorium, however, five fare boxes have been provided in each fare-collecting lobby. In each location an exit without obstruction 10 feet wide has been constructed between the easterly fare-collecting booth and the wall of the lobby.

The fare-collecting lobbies are well lighted both naturally and by artificial light; are painted light colors; and the bridges across the street are also painted with light colored paint and are well lighted.

The capacity of the fare-collecting apparatus at this point has been increased, as follows:



WEST LOBBY INTERIOR, NORTH STATION

	Number of persons passing through per minute Old	New
North Station West	120	720
North Station Proper	120	720
Canal Street Station	240	480
Total	480	1920

PLATFORMS, STAIRWAYS AND PASSAGEWAYS

The Department of Public Utilities required that the platforms at North Station West be lengthened so that 2-stop stations could be provided during entertainments in the auditorium. Gates have been installed to divide North Station West platform into two portions, loading and unloading, but these gates will only be used when required on account of the crowded conditions. The idea was that when large crowds are to be handled, persons desiring to leave trains at this point may do so without being interfered with by persons desiring to board the trains. The department also required that additional stairways to the street be provided to handle the crowds, or for use in emergencies. The only place where these stairways could terminate was in the island near the center of the street. Two such flights of stairs, 5 feet wide, have been provided. The outbound platform has also been widened considerably in the center over the fare-collecting lobby.

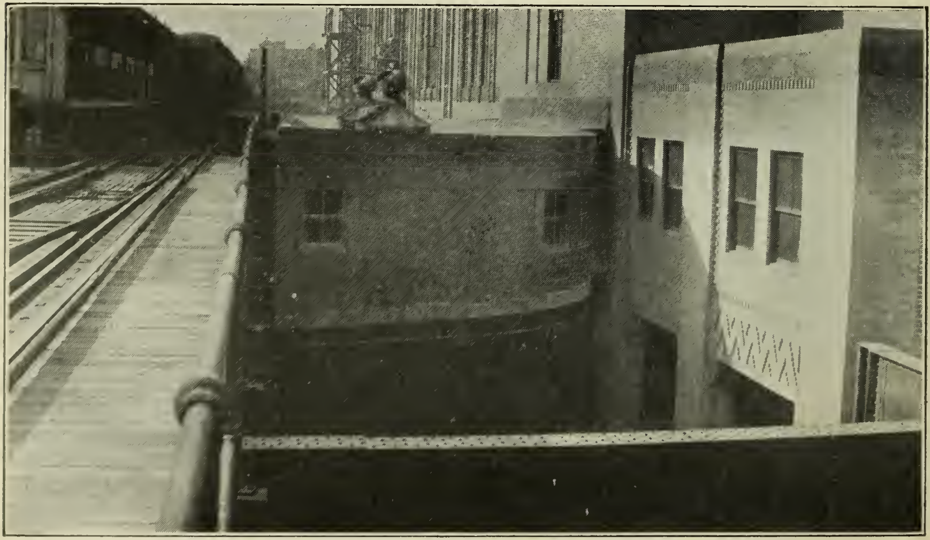
The fence which divided the bridge across Causeway Street near Haverhill Street into two passageways was removed. This causes the bridge to be apparently much wider and allows a large number of persons to use it much more freely than heretofore.

At North Station West the two bridges across the street were retained and an additional bridge was installed with the necessary stairways leading from the bridge level to the upper level.

At the old Boston and Maine Terminal a stairway led directly out of the concourse of the Boston & Maine Station and across the cab stand to the fare-collecting lobby at North Station West. There were also two narrow flights of stairs leading from the sidewalk to North Station West on either side of the cab stand. At the Haverhill Street end, a wide stairway led directly up from the sidewalk to the bridge across Causeway Street, so that persons desiring to enter or leave the North Station on the elevated line could do so and get across Causeway Street overhead. The shuttle station directly in front of the Boston & Maine Terminal was also reached by means of this stairway.

The front of the new Boston & Maine Terminal comes out to the curb line, making it impossible for any stairways to lead from the sidewalk to the Boston Elevated stations. The Boston & Maine Railroad, however, recognized the value of free interchange between rapid-transit trains on the elevated structure and trolley-car trains on the East Cambridge Viaduct, and the Boston & Maine Terminal. Hence the new terminal was designed to provide for such interchange, with provision also for quick entrance and exit from the new Madison Square Garden with its seating capacity of approximately 17,000 people.

At either end of the Boston & Maine Terminal is an entrance about 38 feet wide on the street level. On the audi-



LOBBY EXTERIOR, NORTH STATION PROPER

torium floor level directly over these entrances at either end of the auditorium is a passageway of equal width which is reached by three ramps or combinations of ramps and stairways from the ground level. These passageways are also reached by other stairways leading from the waiting room and the mezzanine floor in the Boston & Maine Terminal. One of these ramps at either end was designed solely for the use of persons desiring to enter or leave the Boston Elevated Railway Stations.

OTHER FEATURES OF INTEREST

The transportation department has given the matter of suitable signs at North Station a great deal of attention. With the co-operation of the Boston & Maine officials, suitable direction signs are displayed in the Terminal at all necessary locations, directing patrons to the ramps leading to the Elevated stations. In addition, signs in and about the elevated structure and passageways direct persons how to change from one type of service to another, or how to reach the Terminal and the street.

In order to provide extra surface-line service, trolley cars can be stored either on Commercial Street or on Beverly Streeet. Traffic using the Tremont Street subway through the Canal Street station can thus be provided with a sufficient number of cars on short notice. Additional cars on the Viaduct can be provided by storing them on the siding at the corner of Lowell and Causeway Streets, or they can be sent from Lechmere Square. Additional trains southbound on the elevated line can be held on the Commercial Street siding and additional trains northbound will have to be provided from Guild Street or Forest Hills.

OTHER CO-OPERATION WAS NECESSARY

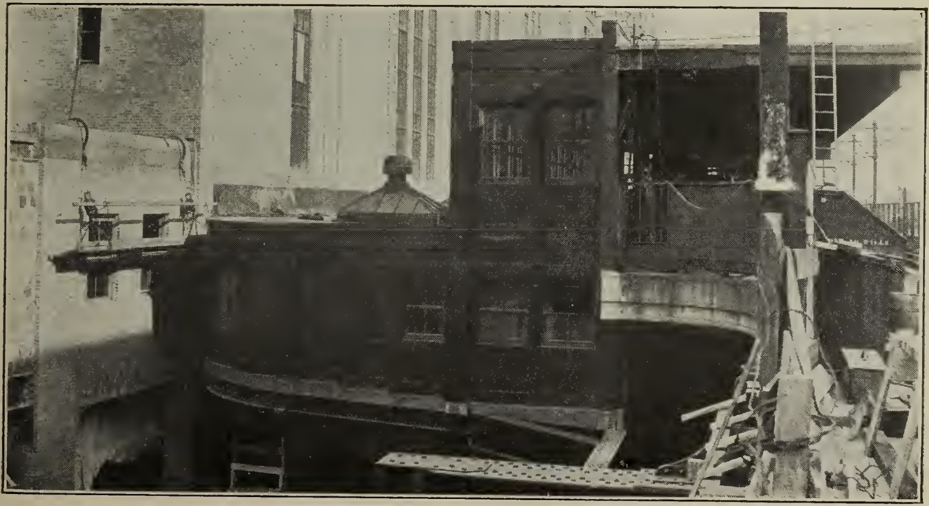
This North Station job furnishes a good illustration of co-operation. The Department of Public Utilities, which approves all such new construction, insisted that there be provided adequate means for taking care of not only the regular business of the Boston Elevated Railway but, in addition, the crowds attending entertainments in the auditorium. This made it necessary for the Railway to co-operate to the fullest extent with the Boston & Maine, with a view to providing suitable means which would be sufficient for all occasions.

It is expected that the additional facilities provided by the Railway under the approval of the Department of Public Utilities will be sufficient to take care of even a capacity crowd at the auditorium as well as caring for the regular business without interference.

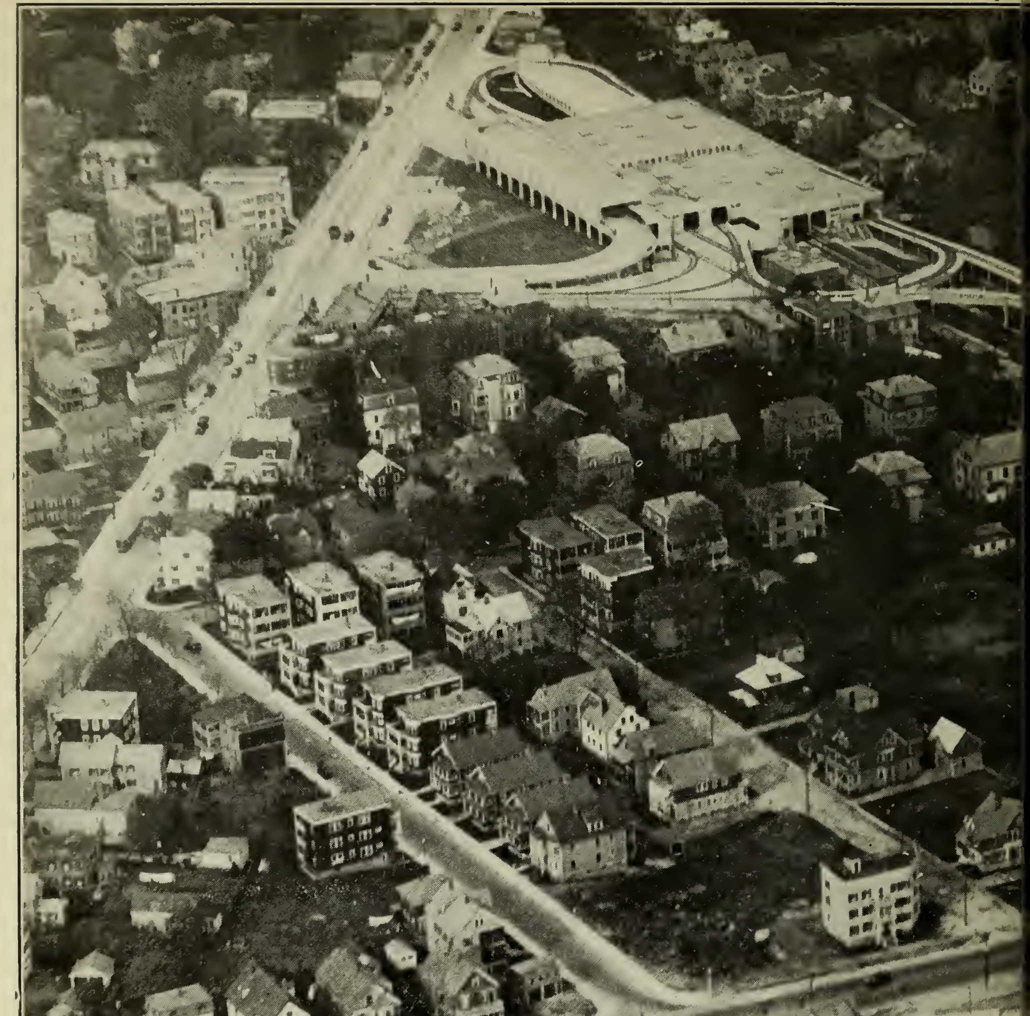
Until the auditorium has been in use for some little time, it is not possible to predict just how the 17,000 people pouring out of the auditorium will divide to take trains or cars for their return journey.

G. O. NO. 182

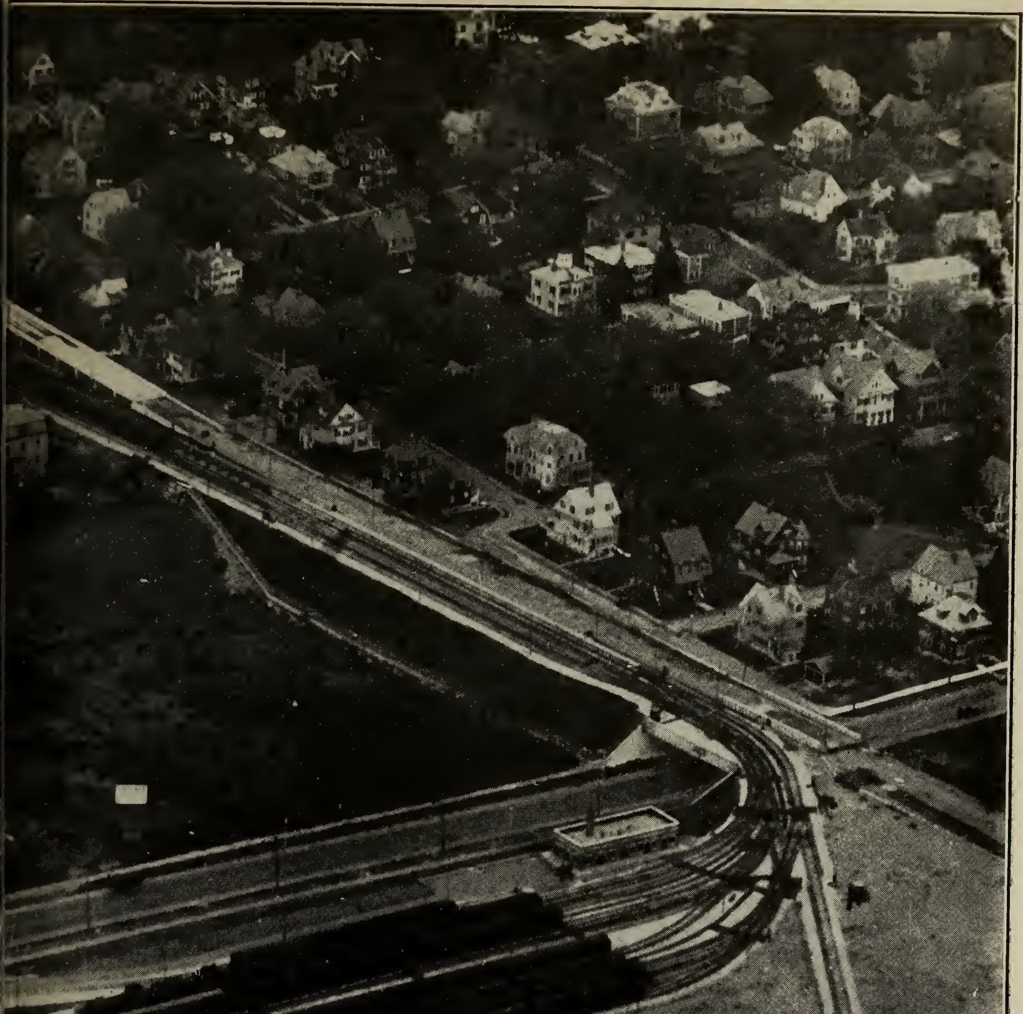
Superintendent James Smith has issued a general order to motormen, bus operators and other operators of cars and motor vehicles calling attention to the new street traffic regulations which have been adopted by the City of Boston. He explains that many changes have been made from the old regulations, and in order that employees may be informed the Railway is issuing to every motorman, bus operator and other operator of cars and motor vehicles a copy of the new regulations. They are expected to know the traffic regulations.



WEST LOBBY, NORTH STATION, UNDER CONSTRUCTION



How the Ashmont Terminal



opment Appears from the Air

HOW TO STUDY* — II

As Explained in the October Issue This Helpful Paper Is Being Reprinted for the Benefit of "El" Employees, Including Their Families. It Is Not Only Interesting to Read but Can Be Applied Every Day

By GEORGE FILLMORE SWAIN, LL.D.
Professor of Civil Engineering, Harvard University

> "Reading alone, no matter how extensive, or how retentive the memory, will not give wisdom or power."—*G. F. Swain.*

Editor's Note. *The first instalment of Dr. Swain's paper was concluded, in the October issue, page 157, with the contrast between the modern person who thinks and the ancients who were superstitious because uninformed. The paper continues as follows:*

To primitive peoples nature was a closed book. The simplest phenomena were beyond their understanding, and they, therefore, imagined deities of whose personal activities these phenomena were supposed to be manifestations. With the progress of science many phenomena once mysterious and looked upon as facts have become easily explained. The intelligent student, however, can generally distinguish between statements of the different kinds which have been described, and he should constantly endeavor to explain or seek the reason for new statements by relating them to the body of knowledge which he has previously gained. Unfortunately, the average student reads only to accept what is written, whether fact, conclusion, or opinion, perhaps memorizing it verbatim under the impression that by so doing he is learning; he does not examine or reflect upon it, and often even accepts as facts what are explicitly stated to be mere expressions of opinion. Thus palpable mistakes, or even typographical errors, which a careful student should detect at once, are often accepted and believed. It is for this reason that it is so easy to deceive most people, at least for part of the time. They do not think for themselves, and all that is necessary to make them believe what you say is in some way to get them to think you are an authority.

Regarding Facts Which He Does Not Then Investigate the Reason for, He Should Ask How They Are Ascertained

This will draw his attention to methods of observation and experiment, or to the technique of the subject. How, for instance, is it ascertained that New York is 90 miles from Philadelphia, or that the sun is ninety-two million miles from the earth? It is always possible to ascertain, at least in a general way, how a fact is ascertained, though it may not be possible to determine the reason for the fact. This applies not alone to physical sciences, but to questions of an economic, historic or sociological character. If we read that at the Battle of Gettysburg 3072 Union soldiers were killed, we do not inquire why; such a question is clearly meaningless; but we may well inquire how this was ascertained, whether by counting the dead upon the field or by the roll call, etc.; or if we read that following the issue of large quantities of paper currency during the Civil War, the amount of gold in the country decreased, we may in this case also inquire how it was ascertained, and we may further perceive that this is a fact for which there must be a reason, and we may then or later ascertain why it is true.

The Student Must Train Himself to be Constantly on the Watch for Evidence of Reliability in the Writer He Is Studying, in Order That He May Get a Correct Impression as to Whether His Statements of Fact May Be Accepted, as Well as His Conclusions and Opinions

Many writers are careless, some are entirely unreliable, and some wilfully distort. Not only are the opinions sometimes expressed entirely unwarranted by the facts, but often statements of mere fact, such as those of statistics, may be grossly perverted, sometimes intentionally. Erroneous conclusions or opinions which are the result of illogical reasoning from correct facts may be discovered by the student who himself knows how to reason, but perversions of fact may escape detection, if not traced back to original authorities or observations, which the student may not have time or opportunity to do. Statistical results, or statements made in books on economics, history, and sociology, are particularly liable to distortion, intentionally or unintentionally. Indeed by selecting certain statistics and excluding others, almost anything depending upon statistics may be proved.

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The importance is thus obvious of being able to detect signs of reliability and accuracy, and of discarding a writer who cannot be depended upon. It is also important to make it a rule to ask whether any result when reached appears to be reliable in the light of common sense. Sometimes a suggestion of error will be observed if the subject is looked at in this light, which if traced back will lead to the discovery of some mistake in observation or some error in reasoning.

Evidence of unreliability shown by a writer may generally be discovered, if care is exercised. His temperament, age, environment, training, religion and other facts will contribute. One who is dogmatic or abusive in stating what are obviously mere opinions which cannot be demonstrated, or who is intolerant of those who reach different conclusions, is obviously by temperament untrustworthy. A writer who in a single instance can be shown to have intentionally distorted facts should, of course, be at once and forever rejected; one who has distorted facts unintentionally may perhaps be forgiven once. So a writer who, in a matter not capable of mathematical demonstration, and to some extent a matter of opinion, sets out to prove a preconceived idea, shows himself in general not possessed of the qualities which should inspire confidence.

By these and other tests the student should constantly be on the watch to form his opinion of the credibility and reliability of a writer or experimenter whose work he is studying. He may thus guide himself as to the books which he should pursue carefully, remembering the dictum of Bacon that "Some books are to be tasted, others to be swallowed, and some few to be chewed and digested," except that very few, if any, are to be literally swallowed without digestion. By careful observance of the injunction to study constantly the credibility of a writer one may become what may be termed a discriminating student.

ANOTHER ESSENTIAL ELEMENT OF A PROPER ATTITUDE OF MIND IS CAUTION

Always realize the possibility of error both in another and in yourself. Be on your guard against intentional or unintentional deception. As Bacon said, "Read not to contradict and to confute, nor to believe and take for granted, nor to find talk and discourse, but to *weigh and consider*."[1] The author you are reading may have made a mistake, or may be trying to mislead you. "When we think of the difficulty of finding the way, when we are most desirous to go right, how easy to mislead those whom we wish to go wrong!" Be, therefore, always suspicious of your author, and subject all his statements to the test of your own intelligence.[2]

STUDY WITH AN OPEN MIND, AND WITH NO PRECONCEIVED IDEAS

Cultivate the scientific attitude of mind, which means, first to formulate clearly a problem, then to get together all the pertinent facts, and then to draw the logical conclusions. Be ready to accept gladly any logical conclusion from the facts, even if unpalatable. Truth is, or should be, the sole object of study.[3]

BE MODEST INTELLECTUALLY, YET SELF-RELIANT. TRAIN YOURSELF TO LOVE CORRECTION

Remember these sayings from wise men:

"Whose loveth correction loveth knowledge;
But he that hateth reproof is brutish."
—*Proverbs.*

"Poverty and shame shall be to him that refused correction;
But he that regardeth reproof shall be honoured."—*Proverbs.*

"The beginning of wisdom is the knowledge of one's faults."—*Epicurus.*

"He that being often reproved hardeneth his neck
Shall suddenly be broken, and that without remedy."—*Proverbs.*

"Reprove not a scorner, lest he hate thee;
Reprove a wise man and he will love thee."—*Proverbs.*

"Be not wise in thine own eyes."—*Proverbs.*

"The true beginning of wisdom is the desire of discipline."
—*Wisdom of Solomon.*

"Censure and criticism never hurt anybody. If false they can't hurt you unless you are wanting in manly character; and if true, they show a man his weak points, and forewarn him against failure and trouble."—*Gladstone.*

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[1] "There are always people ready to assume that things are what they are called, because it is much easier to deal with names than to examine facts."—**Bryce: South America.**

[2] "A wise man knows an ignorant one, because he has been ignorant himself, but the ignorant cannot recognize the wise, because he has never been wise."—**Persian Proverb.**

[3] "Table talk proves that nine out of ten people read what amuses them, rather than what instructs them, and proves also, that the last thing they read is something which tells them disagreeable truths or dispels groundless hopes. That popular education results in an extensive reading of publications which foster pleasant illusions rather than of those which insist on hard realities, is beyond question."—**Spencer: The Coming Slavery.**

"If there's anything worse than knowing too little, it's knowing too much. Education will broaden a narrow mind, but there's no cure for a big head. The best you can hope is that it will swell up and bust, and then, of course, there's nothing left. Poverty never spoils a good man, but prosperity often does. It's easy to stand hard times, because that's the only thing you can do, but in good times the fool-killer has to do night work."—*Lorimer: Letters from a Self-made Merchant to his Son at College.*

Intellectual modesty is quite consistent with self-reliance and mental courage.

The study of books too often leads to intellectual arrogance, which is the surest bar to real mental progress. Realize the limitations of your own knowledge; see clearly what you know and what you do not know, otherwise you will see the things you know out of proportion. Make sure, however, that you know the fundamentals. Socrates said that a knowledge of our ignorance is the first step toward true knowledge, and a Persian proverb says:

"He who knows not, and knows not that he knows not, is a fool; shun him.
He who knows not, and knows that he knows not, is a child; teach him.
He who knows, and knows not that he knows, is asleep; wake him.
He who knows, and knows that he knows, is wise; follow him."

Ask yourself, which of these classes you belong to.

Remember that the Object of Study Should Be to Gain Wisdom, Rather than Knowledge

Facts are important and must be learned; but far more important is it to gain wisdom and to train the mind and judgment so that truth may be distinguished from error. As the poet says:

"Knowledge and wisdom, far from being one,
Have oftimes no connection. Knowledge dwells
In heads replete with thoughts of other men;
Wisdom, in minds attentive to their own.
Knowledge is proud that he has learned so much,
Wisdom is humble that he knows no more."

The above points all have to do with the mental attitude of the student, and may be summarized by simply stating—that the student must be possessed of *mental courage, self-reliance, discrimination, modesty, and caution, all in proper proportion.*

WHY MEN FAIL

BY B. C. FORBES

Reproduced by permission from the New McClure's, October, 1928

Men Fail Because of:

1. *Faulty characters.*
2. *Habits detrimental to mind and body.*
3. *Lack of fixity of purpose.*
4. *Laziness, mental and physical.*
5. *Inadequate foundation-laying.*
6. *Failure to find joy in the job.*
7. *Putting pleasure before work during formative years.*
8. *Impatience—shiftlessness.*
9. *Lack of guts.*
10. *Poor judgment, born of ignorance.*
11. *Fear of shouldering responsibilities.*
12. *Untrustworthiness.*
13. *Swell-headedness.*
14.—*Failure to look ahead, think ahead—to exercise foresight.*
15.—*Jealousy.*
16.—*Rubbing others the wrong way: tactlessness.*
17. *Too much or too little self-confidence.*
18. *Not learning to be a self-starter.*
19. *Inability to impress others favorably — usually because there's a reason.*
20. *Unwillingness to do more than paid to do.*
21. *Passing the buck.*
22. *Faith in luck rather than in self-help.*
23. *Stubbornness: refusal to acknowledge being wrong.*
24. *Get-rich-quickism.*
25. *Extravagance.*
26. *Failure to keep abreast of the times—through reading, research, helpful contacts.*
27. *Lazily taking too much for granted instead of seeking and sifting the facts.*
28. *Overindulgence in vaulting day-dreams without keeping feet on the ground and an eye on the balance sheet.*
29. *Lack of organizing ability.*
30. *Consciousness of not deserving to succeed: fear.*

MR. BAUCH RETIRES

After 47 years of service with the Boston Elevated Railway and its predecessors, Charles A. Bauch, superintendent, Division 1, has retired from active service.

Mr. Bauch was born just before the close of the Civil War in Boston and graduated from the Gibson Grammar School in 1880. After working for the R. H. White Company as general utility boy and for a firm of cigar makers, he applied for a job at the Dorchester station of the Metropolitan Street Railway. He was fond of horses and eagerly agreed to keep sixteen horses clean for $8 a week. He was soon promoted to shifter, a job which involved seeing that teams were hitched and unhitched properly. Being fond of horses he was anxious to drive but was considered too young until 1883. He then drove for over six years, when he was sent as a foreman over four men and forty horses taken over from the Hawthorne Coach Line. In 1890 he was made night foreman at Park Street and about a year later day foreman in charge of 469 horses and help, with supervision over conductors and drivers as well as cars. In 1898 he was made chief inspector, succeeding Mr. Neal, and in 1917 division supervisor. In 1924 he became division superintendent.

Charles A. Bauch
Former superintendent of Div. 1

Mr. Bauch is married and has two sons and one daughter, all married. One son is in business in Chicago and the other an aviation officer.

Mr. Bauch has had a long and valuable experience in street railway work, combined with sound judgment which made him a valuable man. He was a man who could be trusted in his judgment as well as in his actions and the management regrets the necessity for his retirement.

ARE YOU RECEIVING YOUR COPY OF "CO-OPERATION" REGULARLY?

During the past three months the method of distributing "Co-operation" has been changed gradually so that instead of being distributed through the paymasters as formerly, copies are now mailed to the homes of employees under a special permit.

Such a change as this involves considerable difficulty in revising the addresses so as to insure correctness. The list is being revised, in co-operation with the postmaster at Boston, as rapidly as possible, but it will take several months before it is practically perfect. In the meantime some employees will fail to receive their copies through the mail due to incorrect addresses. Such failure to receive copies should be reported promptly to the General Manager's office. Back copies of "Co-operation" will be mailed to all who have failed to receive their copies if they will ask for them.

HOW CAN WE IMPROVE THE SERVICE?

Suggestions by employees for improvement of service are always appreciated.

Write the general manager whenever you have an idea which, after careful thought and consideration from every angle, you believe would be helpful and he will give it his personal consideration.

EDUCATIONAL CALENDAR FOR DECEMBER

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
2	3 Public Speaking 3rd-Year Foreman Conferences	4 Maintenance Group Conference Topic: Construction Problems at the New North Station Correct English	5 Transportation Group Conference Selling Car Rides Combined	6 Motor Vehicles Arts and Crafts	7 2nd-Year Foreman Conferences	8
9	10 Public Speaking 4th Year Foreman Conferences	11 Correct English	12 Rolling - Stock and Shop Group Conf. Demonstration "The Mechanical Man," by R. J. Wensley	13 Law for Everybody H. Ware Barnum Speaker Arts and Crafts	14 1st-Year Foreman Conferences	15
16	17 Public Speaking 3rd-Year Foreman Conferences	18 Correct English	19 Open for Supervisors' Association Captain Alonzo R. Williams, Speaker	20 Motor Vehicles Arts and Crafts	21 2nd-Year Foreman Conferences	22
23	24	25 Christmas Day	26 Next	27 Meeting	28 on	29 Jan. 2
30 A	31 Happy	New	Year	to	You	All

L. S. STORRS AT GENERAL MEETING

How electric railway employees helped, in Omaha, Nebr., in securing favorable action on a new franchise at the recent election was described by L. S. Storrs, managing director American Electric Railway Association, at a general meeting of employees held at the instruction school on Nov. 19. Mr. Storrs sketched the general transportation situation in an encouraging way, and complimented the "El" management on its progressiveness in education and training. Mr. Dana followed with a plea for salesmanship on the part of all employees, after giving the audience a graphic picture of the economic situation of the railway. The program closed with an instructive picture tracing the development of trans-atlantic flying.

SUPERVISORS MEET AGAIN

At the second meeting for the season of the Boston Elevated Railway Supervisors' Association a symposium of personal impressions of the Cleveland convention of the American Electric Railway Association was presented. This was in accordance with a plan outlined by Mr. Dana at a recent conference of convention delegates. President P. E. Maw introduced and closed the symposium with a general explanation regarding the convention, and various aspects were set forth by the following: A. J. Blackburn, Jos. A. Howard, E. A. Kelley, E. R. Kelly, A. A. Ordway and J. M. Patten.

Excellent vaudeville numbers and hearty community singing rounded out the program of what was considered one of the best meetings ever held by the association.

THIS MONTH'S COVER PICTURE

Suspending for a time the publication of "Boston Elevated Close-Ups," "Co-operation" will carry for a while on the front cover some pictures selected to familiarize all employees with outstanding features of the property and taken from novel points of view. This month's picture was taken from an aeroplane. This month the cover picture is supplemented by a large-scale reproduction of an aerial photograph of the Ashmont Station development. Have you any suggestions for cover pictures?

RESCUE BY "EL" BRIDGEMAN

Early in the morning, on Nov. 9, a motor car crashed through the fence on the upstream side of the Malden bridge about 150 feet north of the maintenance department shop. Bridgeman Justin E. Powers, who was working in the shop at the time, rushed to the rescue of the motor-cab driver. To reach the man he climbed down on the pile structure and into the water up to his shoulders. The man was holding to a rope, but was dazed and ready to let go. His head was badly cut. Mr. Powers held up the nearly exhausted man and at the same time tied the rope around him. It was thus possible to haul the man out of the river and he was sent to the Haymarket Relief Hospital on a passing truck. Mr. Powers suffered no ill effects from his brave act.

To market, to market,
  From near and from far;
Home again, home again,
  On the street car.
—*Exchange.*

Buy Christmas Seals

WOULD you buy Christmas Seals if you knew they had helped reduce tuberculosis from a "white plague to a controllable disease? That in twenty years the death rate had been cut in half—a saving which amounts to more than 125,000 lives in the year 1928 alone?

Then "Buy Christmas Seals," for they are fighting tuberculosis in a hundred ways every day.

Christmas Seals give protection to your friends, to your family—and to *you!*

CHANGES IN THE RESERVE FUND

Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*	Jan.	$191,381.71†
Aug.	408,570.65*	Feb.	75,469.39†
Sept.	147,204.65*	Mar.	159.985.97†
Oct.	79.421.50†	April	43.542.45†
Nov.	34.226.52†	May	93.645.42†
Dec.	280,536.75†	June	179.790.77†

Profit and loss credit.....$666.500.98

Fiscal Year 1928-29

July 1, 1928, $1,000,000

July	$331,329.58*
Aug.	398,356.82*
Sept.	204,840.30*
Oct.	3,135.31†

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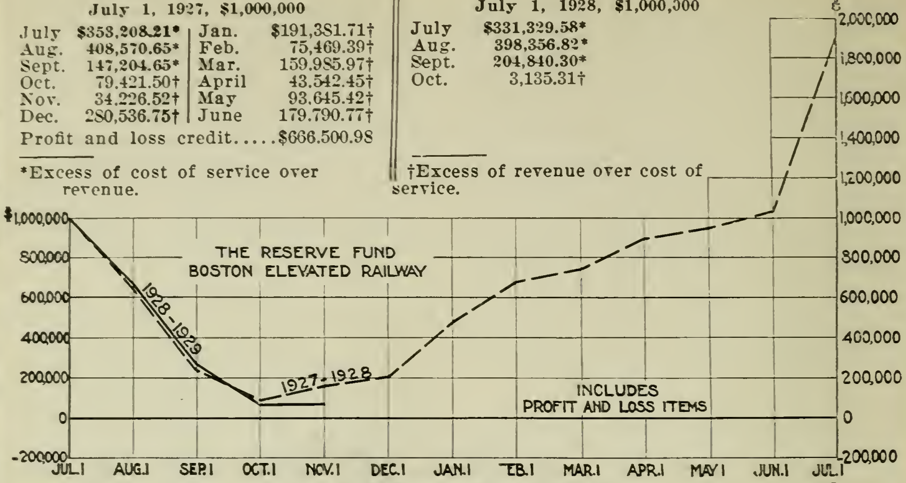
*Excess of cost of service over revenue.

†Excess of revenue over cost of service.



OCTOBER OPERATION

GENERAL FINANCIAL DATA	1928	1927
Revenue exceeds cost of service	$3,135.31	$79,421.56
Operating revenue per car-hour (A.E.R.A. std.)	$6.15	$6.34
Operating revenue per car-mile operated	60.61c	63.34c
Average fare per revenue passenger	9.289c	9.287c
Ratio operating expense to operating revenue	72.25%	70.30%
PASSENGERS CARRIED		
Revenue passengers	31,137,959	30,664,756
Per cent 5c, and 6¼c passengers	18.08%	18.22%
Revenue passengers per car-mile operated	6.333	6.580
OPERATING FACTS		
Trips operated	620,899	593,953
Car-miles operated:		
Rapid-transit lines	1,536,189	1,292,720
Surface, two-man	1,475,293	1,663,605
Surface, one-man	1,367,521	1,246,402
Express, newspaper and sprinkler cars	1,045	1,021
Motor bus	536,421	457,499
Total miles operated	4,916,469	4,661,247
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.89*	2.16*
Accidents per 10,000 bus-miles	2.32*	2.60*
Revenue passengers carried per accident	18,270	17,350
Average number of witnesses per accident	3.64	3.11
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	40	16
Employees complained of by car riders	96	90
Car defects reported per 10,000 car-miles	4.9	3.2
INFORMATION ABOUT POWER		
D. c. kw.-hr. output gross for month	19,090,745	17,202,840
Maximum kw. load	72,110	59,020
Tons of coal consumed for power	15,451	14,844
Lbs. of coal for power per d.c. kw.-hr. at cars	1.828	2.029
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	0.985c	1.15c
Per revenue car-mile	3.91c	4.26c
Kw.-hr. per revenue car-mile	3.970	3.618

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*Does not include miscellaneous accidents or derailments.

November 21, 1928

EDWARD DANA, *General Manager.*

BOSTON ELEVATED RAILWAY

CO-OPERATION

Volume 7 DECEMBER, 1928 Number 12

Contact

Conference

Confidence

Co-operation

THE FOUR C'S OF A SUCCESSFUL NEW YEAR

(See Page 189)

To All 'El' Employees

AT this season of the year the Railway carries many more passengers than at any other season. December is, of course, the peak, due to Christmas shopping and to home gatherings of this season. January is an almost equally heavy traffic month.

From the standpoint of our customers, winter riding on trains, cars and buses cannot be as comfortable as when the riding density is less, particularly during the rush hours. There is thus placed upon each employee an added responsibility to offset in every possible way the necessary discomforts of rush-hour winter riding.

This can be done by insuring that cars are properly ventilated and kept clean, that patrons be given every courtesy with careful regard for their comfort and convenience and that every precaution for the safety of the patron be taken.

Will you not all co-operate even more than ever this winter to please the customers of the Railway?

Edward Dana

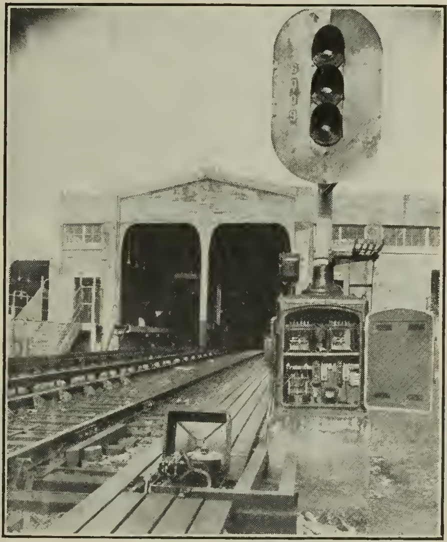
SIGNALS AND INTERLOCKING AT ASHMONT

Handling of Trains Is Facilitated and Safe Operation Assured at the Terminal of the Dorchester Rapid-Transit Extension by Electro-pneumatic Apparatus of Latest Types—Operating Tower Adjoins New Automatic Sub-station South of Main Building

WITH the opening of the Dorchester rapid-transit extension from Fields Corner to Ashmont on Sept. 1, 1928, a new power interlocking at the easterly end of Ashmont Station was put into service to handle train movements to and from the main line, siding and yard tracks in both directions.

An interlock, as probably most of the readers of "Co-operation" have learned from a previous article, provides a means of remotely controlling the position of track switches and governing signals quickly and economically in a manner to prevent making conflicting train movements.

This interlocking is of the alternating-current, electro-pneumatic type, in which the track switches are operated by compressed air, which, in turn, is controlled electrically; while the signals, being of the color light variety, are entirely electrical.



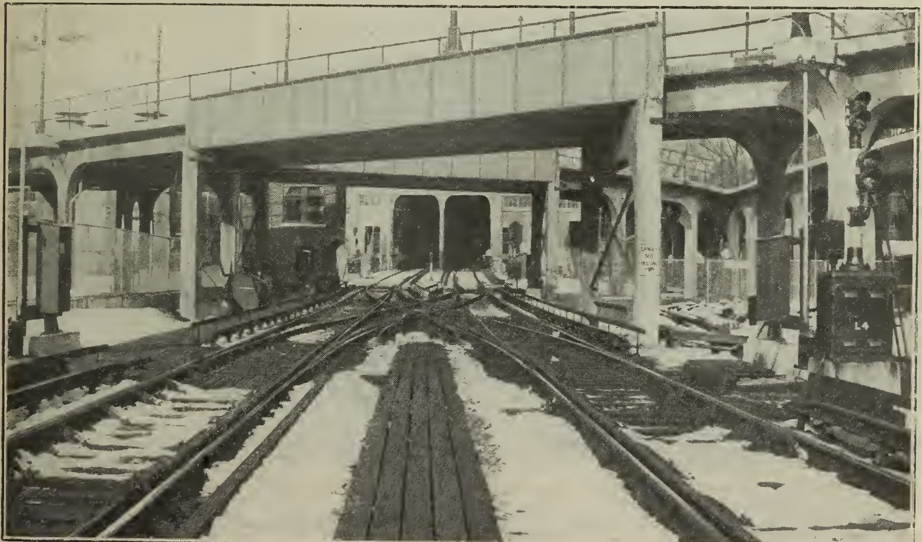
SIGNAL AND AUTOMATIC STOP

The automatic train stops of interlocked signals are also of the electro-pneumatic type.

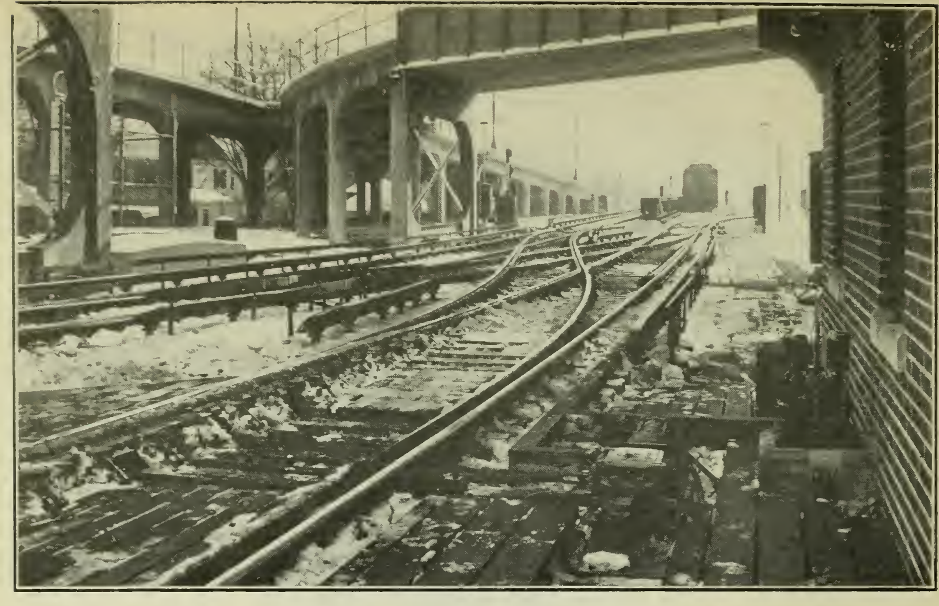
The interlocking machine is probably the most interesting part of the equipment employed, since it is from here that the operator, by the movement of small machine levers, sets up the desired route and clears the proper signal to permit a train to take that route with safety.

Within the machine is located the mechanical locking between the operating levers, which insures that the levers affecting all switches in a given route are in their proper positions before the lever controlling the governing signal for that route can be operated.

Also within the machine is the electrical contact

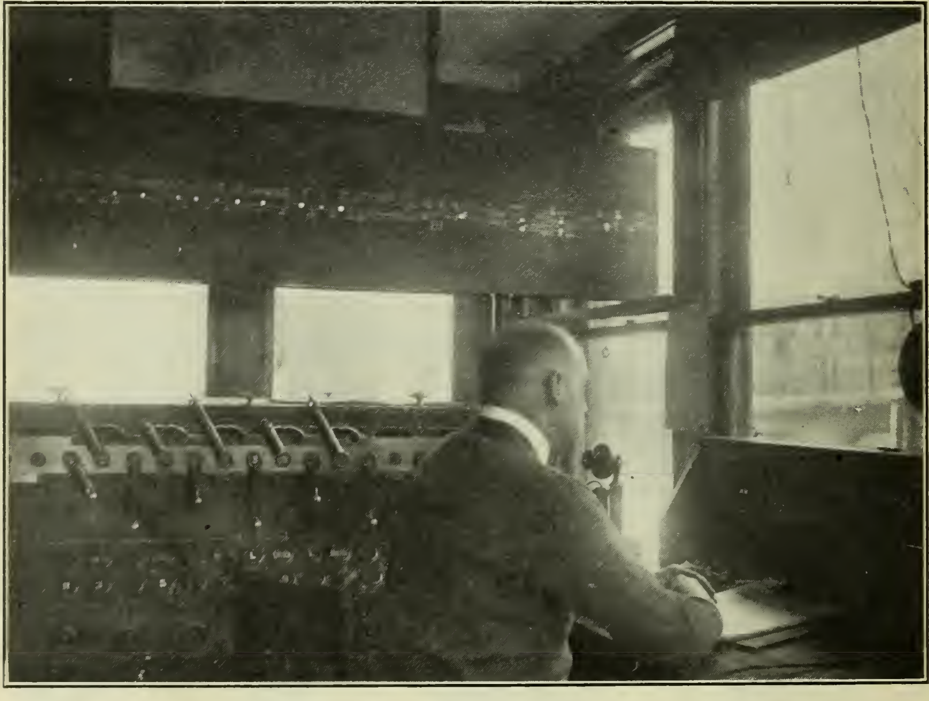


LOOKING TOWARD ASHMONT STATION FROM TRAINMEN'S PLATFORM



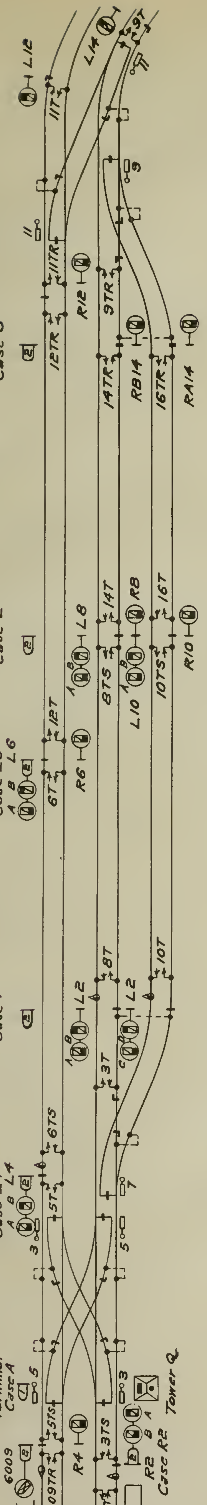
INTERLOCKING AT ASHMONT

Trainmen's platform in the distance. This picture was made from in front of tower "Q," which is visible in part at the right. It includes the same trackwork as the picture on page 179, but viewed from the opposite direction. In the picture above, the surface-car viaducts are clearly shown. The plan reproduced on page 116 of the issue of "Co-operation" for August, 1928, shows the layout of these viaducts and other features.



SIGNAL AND INTERLOCKING TOWER

The towerman has an unobstructed view in three directions. Referring to the picture of the tower on page 181, the window directly in front of the operator is seen as the second front window from the right on the upper floor of the tower. In the picture above are seen the interlocking machine below and the train indicator above it.



LAYOUT OF INTERLOCKING AT ASHMONT STATION

Details such as signals, track transformers, etc., are indicated by the standard symbols of the Signal Division, American Railway Association.

TOWER "Q"

combination which selects and supplies energy to the numerous controlling circuits, and the electric indication locks which serve as a means of checking the actual movement of the switch points. It is necessary that the switch points complete their full travel in the direction operated, and indicate back to the machine electrically, before the machine lever movement can be completed.

A failure of the switch points either to make their full travel or to indicate back to the machine will at once be detected by the operator from his inability to complete the lever movement. Until this has been completed, the signal authorizing a train to pass over that switch cannot be given.

The automatic train stop is a safety device which may be likened to a sentinel on duty at each signal to enforce strict obedience of its indications. If the signal displays a "proceed" aspect, a train may proceed so without trouble, but if a danger or "stop" warning is shown, the device raises a tripper arm and is prepared to open a valve in the air-brake system of any train that might attempt to pass. The result would be an emergency application of the brakes and stopping of the train.

The electrical power for the operation of all interlocking apparatus is taken from the Railway's main alternating-current power supply at 13,200 volts. It is stepped down to 575 volts for transmission to this location, where it is again reduced to 12, 55 and 110 volts for control-circuit use.

The compressed air, at approximately 90 pounds pressure, is furnished by two 30-foot motor-driven, air-cooled Westinghouse compressors located on the ground floor of the tower. The compressors are automatic in their operation to maintain a reasonably constant pressure.

One compressor working about one minute out of every nine provides all the capacity required. The other is held in reserve.

After leaving the compressor under pressure, and at a considerable rise in temperature, the air is put through an atmospheric cooler, where it again assumes the temperature of the surrounding free air. The condensation moisture is then separated from it and it passes to the storage tank.

From the storage tank a 2-inch main pipe with ¾-inch branch lines carries the compressed air to all switch and automatic stop mechanisms throughout the interlocking. Ample means of communication have been provided between the interlocking tower, station and yard in the form of telephones, bells and annunciators.

Light indicators, repeating the positions of all block signals approaching Ashmont, eastbound, show the location of all trains from Columbia Station. This information is of great value in maintaining the westbound schedule, for from the location of an approaching train it is known in advance whether it will arrive in time to take its proper place in the leaving schedule, or whether a reserve train from the yard must be put in to fill the gap.

The system embodies the most up-to-date methods and equipment throughout, and the installation was made for the City of Boston Transit Department by the signal-division men of the Railway's maintenance department.

DON'T TROUBLE TROUBLE!

By James Edward Hungerford

If you don't trouble trouble, it won't trouble you;
Just sidestep the "worries and frets";
There are plenty of things that are pleasant to do
That leave no "remorse" or "regrets"!
Fight shy of the hives where the "trouble-bees" buzz—
They're not to be wandered among,
For if you go there, you will kick up a "fuss,"
And beat a retreat—badly stung!

Don't go where they're "croaking" about the "hard times,"
And forecasting troubles to come;
They'll keep you from harvesting dollars and dimes,
And put all your hopes "on the bum"!
Don't go where they're moaning and groaning and "blue,"
And seeing disaster ahead.
Because if you do, they'll put skids under you—
And knock all your ambition dead!

Steer clear of the crowd that is wailing of woe,
And bluer than indigo ink:
Where trouble is brewing, be wise and don't go,
Or it will put you "on the blink"!
This world is a good place to live in and be—
If you will just hold to that view,
And don't trouble trouble, and only good see—
Old trouble will not trouble you!

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NURSING AND FIRST AID

On January 25, at 6 p. m., at the Dudley street schoolroom, will occur the first meeting in this new course. It will be conducted by the Boston Metropolitan chapter of the Red Cross. There is a large advance registration but a few more applications can be accepted.

"EL" RADIO TALKS

During the past few weeks the Railway has been broadcasting weekly messages through station WEEI as part of the "Transportation Half-Hour." The messages were sent Saturday morning, designed to interest housewives, and through them all members of the household. Typical talks are reproduced below.

Salesmanship on the Part of "El" Employees

As part of an educational program which has been under way for several years, the management of the Boston Elevated Railway endeavors to interest all employees in salesmanship.

The patron of the railway service is considered as a customer to whom the service can be sold.

The selling must be done in competition with the private automobile, with a view to proving to the customer that the railway service is safer, more convenient and cheaper than the use of his own automobile in the congested districts of Metropolitan Boston.

It would be ridiculous to deny the numerous points of superiority of the automobile in its own field, but, in general, this field is not transportation in the districts served by the Railway's rapid-transit and connecting surface-car and bus lines.

The Railway management realizes that its employees cannot do much selling by the usual method of talking, especially when on duty. Their attention is required for their primary duty of attending to the comfort, safety and convenience of the customers.

However, they can perform their duties in a pleasing manner, with courtesy and consideration for all.

The many commendatory letters which are received by the management of the Railway indicate that much good salesmanship of the right sort is manifested by its train, car and bus operators.

To back up the employees in their effort to please the customers, the Railway management has issued an attractive, interesting and useful guide and information folder. A copy will be sent without charge on mail or telephone request. Call Hancock 1800.

Travel in the Non-Rush Hours

This is the season when congestion of traffic on the lines of the Boston Elevated Railway is at its maximum. While the Railway has ample equipment to provide for all transportation requirements of the communities which it serves, unfortunately most of the patrons find it necessary or desirable to travel at what are known as the rush hours. This tends to overcrowd the cars and buses morning and evening, leaving them with many vacant seats at other periods of the day.

While hundreds of thousands of daily patrons cannot avoid traveling in the rush hours, there are many thousands, possibly hundreds of thousands, who could rearrange their plans slightly so as to avoid the rush hours. They would thus find the riding more comfortable and would avoid delays which are most apt to occur during periods of congestion. There is a 7-hour stretch from 9

(Please turn to page 186)

ADMINISTRATION OF THE LAW *

In This Popular Presentation of the General Aspects of Legal Procedure the Lecturer Brought to a Close Last Year's Highly Successful Course in Everyday Law

By ABRAHAM E. PINANSKI, ESQ.
Attorney at Law, Boston, Mass.

DEFINITIONS OF TERMS

THE *jurisdiction* of a court is the power and authority over persons, property and controversies as to which the court can act with binding effect. The *venue* of a lawsuit means the locality in which the lawsuit must be brought. Lawsuits are sometimes spoken of as *actions*. A *writ* is a formal document with which a party begins a suit. It is an order by the Chief Justice of a court, signed by the Clerk of Court and having blanks in which the attorney for the party suing (i.e. the plaintiff) fills in a general statement of the kind of lawsuit, the amount claimed, and the date when the writ will be filed in court,—this date being known as the return day of the writ. A writ is in the form of an order to the sheriffs and their assistants, known as deputy sheriffs, to summon the party sued (i. e. the defendant) to answer unto the plaintiff.

A *subpoena* is an order, on a printed blank, addressed to a desired witness, signed by a Justice of the Peace, and commanding the witness to appear in court on a day named, to testify in a lawsuit named.

KINDS OF LEGAL PROCEEDINGS

Actions of Contract. Such actions include lawsuits brought to recover damages for failure to perform a contract, and also actions for failure to perform certain duties which the law imposes, for example, the duty to pay taxes.

Actions of Tort. Such actions include suits to recover compensation for personal injuries and property damage caused by negligent or wilful acts; suits for libel and slander; suits for deceit; suits for prosecuting a lawsuit without sufficient cause; suits for conspiracy of several persons to accomplish unlawful results, or lawful results by unlawful means.

Replevin. This is an action, not for money damages, but for the recovery of a specific piece of personal property,—for example, a piano or a race-horse, which one man claims is being unlawfully withheld from him by another.

Bill in Equity. Such bills are frequently filed when a man is not necessarily looking for damages, but for the interposition of the power of the court to accomplish some positive result. For example, a singer contracts to sing exclusively during a certain season for a theatrical producer, and then breaks the contract and proceeds to sing for a rival producer. Such a controversy will frequently be determined by the first producer filing a Bill in Equity, asking that the singer be enjoined from singing for the second producer during the term of the contract. Bills in Equity are also employed to bring about a receivership of a business concern, for the purpose of winding up its business or reorganizing it.

Domestic Relations. Appropriate proceedings are available for covering this field, including divorce proceedings, separate support, custody and adoption of children, guardianship of minors and insane persons.

Settlement of Estates. The probate of wills, the appointment of executors and administrators, and the supervision of the administration of estates and of trusts created by wills or other written instruments, are all governed by appropriate proceedings, mostly in the Probate Court.

Bankruptcy. The settlement of the affairs of insolvent persons is attended to by bankruptcy proceedings in the Federal Courts under the Federal Bankruptcy Act. In case the Federal Act should be repealed and Congress should fail to substitute another in its place, the states would then have authority to deal with this subject.

Extraordinary Remedies. There are a few of these. *Mandamus* is a proceeding seeking an order from the court compelling a public officer to perform his duty in a given situation. *Habeas Corpus* is a proceeding which is considered fundamental in a state of society which respects the liberty of the individual. By it, a man who claims he is being unlawfully held in jail, or otherwise under restraint, may have the question summarily determined. It has been successfully resorted to in the case of a person who claimed that he was about to be unlawfully deported from this country.

THE STATE COURTS

Supreme Judicial Court. The highest court of Massachusetts is the Su-

(Please turn to page 187)

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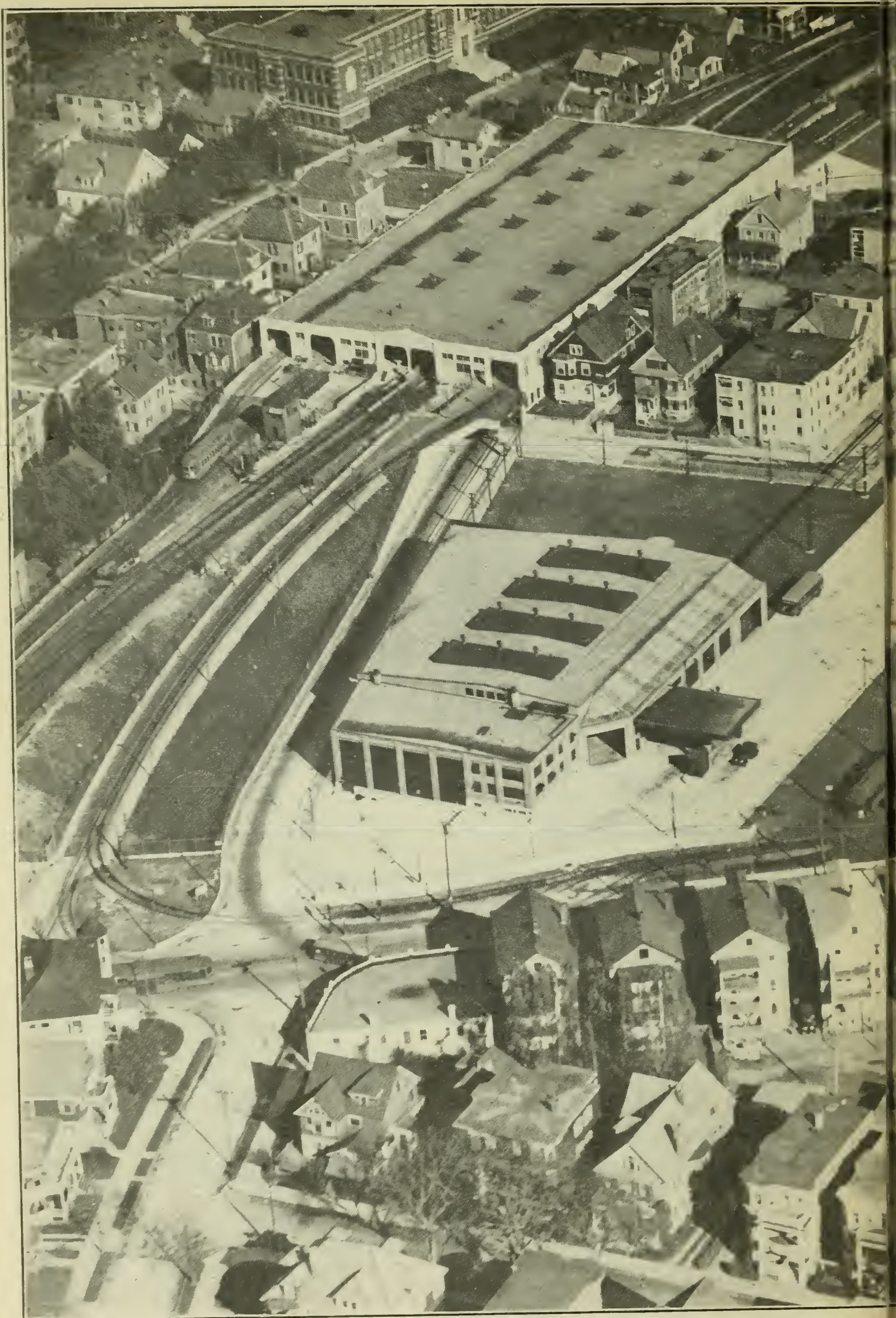
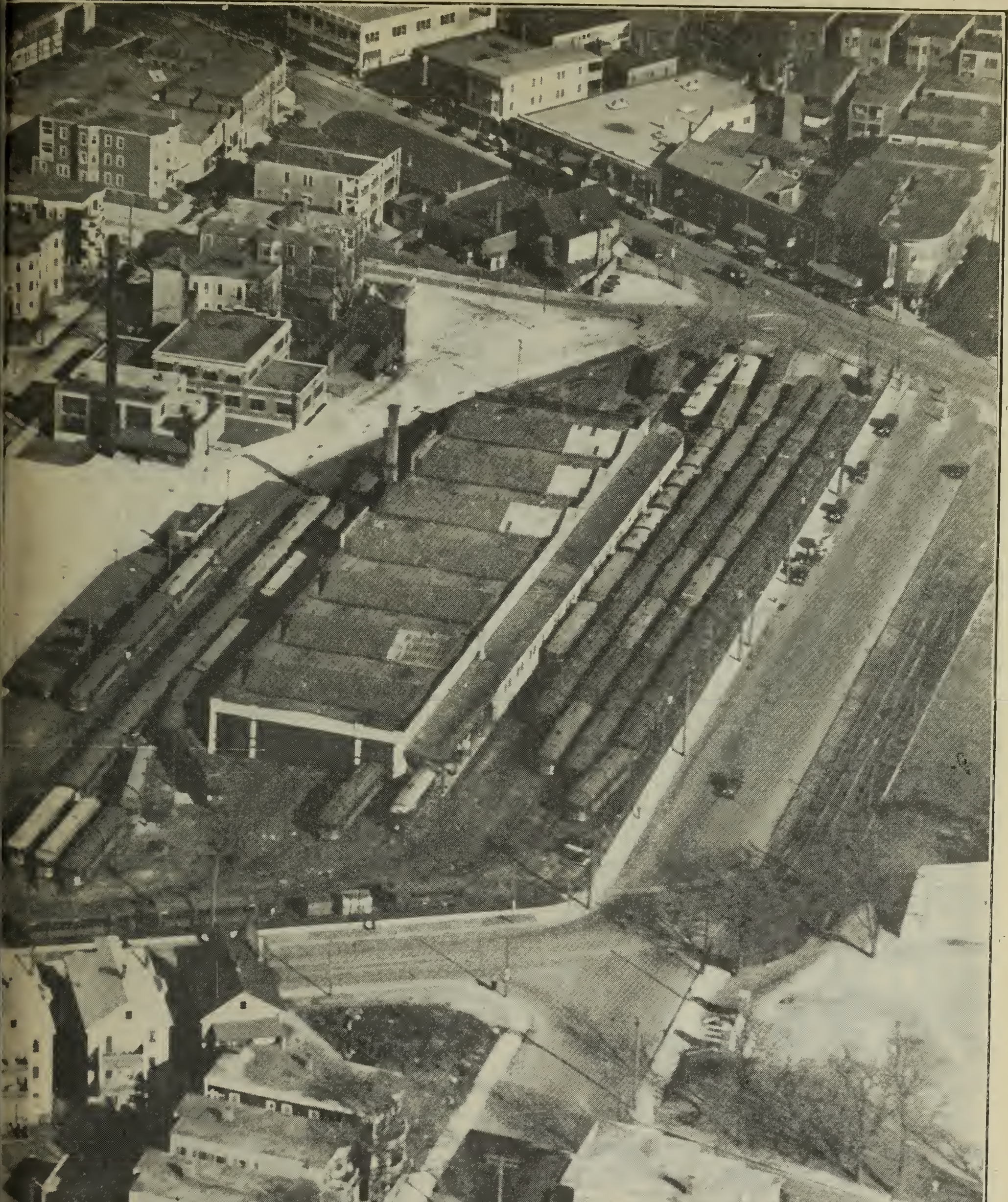
*Abstract of the tenth lecture in the course in Every-day Law, F. W. Casey and E. M. Brooks, committee in charge, delivered at Franklin Union and Sullivan Square, Monday, March 19, 1928.



Fields Corner Station, Bus Garage, Carhouse,

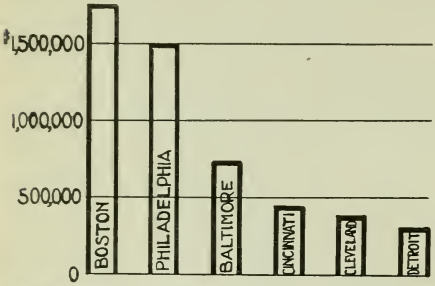


ace Car Yard and Surroundings, from the Air

RAPID TRANSIT REQUIRES LARGE INVESTMENT

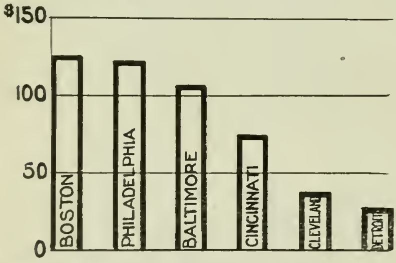
Facts Regarding Boston and Other and Comparable Cities Are Cited to Show Relative Investments and Areas and Population Served

THE Boston community is fortunate in having so complete a transportation system, for its population and size, as compared with other cities in its class. Rapid transit is an expensive form of transportation, but highly desirable for the permanent prosperity of a community which can afford it and wherein the people are willing to pay for what they get.



Investment per square mile for area served

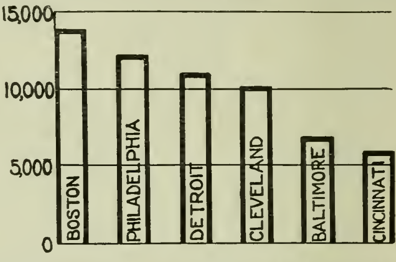
With the aid of the accompanying charts it is possible to make some interesting comparisons of railways with rapid transit and others without it. Thus in Detroit, where there is no rapid transit, the investment in the railway is $306,230 per square mile, whereas in Boston it is $1,740,000 or 467 per cent more! The investment per inhabitant is 350 per cent more in Boston than in Detroit.



Investment per resident in area served

Philadelphia has considerable rapid transit, but not yet proportionally as much as Boston. Hence one would expect to find the investment there much greater than, say, in Detroit, Cincinnati, Cleveland or Baltimore, but not as great as in Boston. And this is just what the chart shows. Comparing the investments as before, Boston has 20 per cent more money invested per square mile in its railway system than Philadelphia, and over 2½ per cent more per inhabitant. This is the situation with the new Broad street subway in Philadelphia about one-half completed.

The six cities selected for examination fall into three groups on the basis of density of population served. Cincinnati and Baltimore are least densely settled, Cleveland and Detroit come next, and Philadelphia and Boston are the most densely settled. Of these six cities, those with the densest population and rapid transit represent the largest investment in proportion to area and population served, those with the least dense population and no rapid transit come next and those with a rather dense population and no rapid transit were the cheapest to build and equip.



Residents per square mile in area served

"EL" RADIO TALKS

(Concluded from page 182)

in the morning until 4 in the afternoon during which the Railway's cars and buses could carry comfortably many more customers than at present. If you can plan your shopping or other business so as to ride during these hours will you not do so for your own convenience and comfort? This is particularly desirable during January, February and March, when snow is apt to add to the complications of providing transportation service, particularly during the rush hours.

"EL" TRANSPORTATION IS BEST IN DOWNTOWN SECTIONS

Patrons of the Boston Elevated Railway in the Dorchester section will appreciate the commodious parking space which is now available at a moderate fee at the Ashmont Terminal. There are obvious advantages in storing cars at this point and using the splendid Dorchester rapid-transit extension in reaching downtown Boston and beyond. There is a growing practice among "El" patrons of storing their automobiles at outlying points and using the Boston Elevated System to take them to their destinations. The wisdom of this practice is evident if one considers the superiority of a rapid-transit railway over the automobile for transportation in heavy-traffic areas. Among the points of superiority the first is safety; another is the responsibility of the Railway as a business concern. In many cases time may be saved by using the "El." Again, the "El" relieves its riders of downtown parking worries. It also furnishes them an opportunity to read their newspapers in comfort. Comparatively few people can profitably drive into the downtown section of Metropolitan Boston. The "El" is organized to transport people from where they are to anywhere they want to go at a minimum of cost and a maximum of convenience.

ADMINISTRATION OF THE LAW

(*Continued from page 183*)

preme Judicial Court, consisting of seven Justices, whose main function is to constitute an appellate tribunal, to decide finally points of law which have been contested in the lower courts. Such points are appealed to the Supreme Court in order that justice may be done in the particular controversy. But the decisions of the court are printed in volumes and are thus official precedents serving for the guidance of the lower courts, and of members of the bar in advising clients.

When sitting as a Court of Appeals, the Supreme Court must sit with at least four Justices. In fact five Justices commonly sit.

The Supreme Court also has jurisdiction, sitting as a full court, to remove various public officers, "if sufficient cause is shown therefor and it appears that the public good so requires." The Supreme Court still retains some original jurisdiction wherein a single Justice of that court may hear a case and determine questions of fact as well as of law.

The Superior Court. This is the great trial court of the Commonwealth, with juries and without juries. Like the Supreme Court, it has jurisdiction throughout the entire state. Its thirty-one Justices sit from time to time at the various county seats, and any Justice may be assigned to any sitting in any county. Practically all the jury trials are held in this court. It has jurisdiction over actions of contract, tort and replevin, and bills in equity, and when a question for a jury arises in the Land Court it is referred to the Superior Court.

The Lower Courts. These include the several Municipal Courts, the District Courts and the Courts of the ten Trial Justices, who hold court, in lieu of District Court, at various places. In general the District Courts have jurisdiction only of controversies not exceeding $3,000 in amount, but in Boston Municipal Court the limit is $5,000. They also have jurisdiction of what is called *Summary Process*, a proceeding by which a landowner, having immediate right to the possession of his land, can obtain it as against an adverse occupant.

The lower courts, unlike the Supreme and Superior Courts. have only a local jurisdiction. The Municipal Court of Boston, for example, and the Municipal Court of Worcester, are absolutely distinct and separate, and ordinarily the judge of one District Court cannot sit in the court of another district. The lower courts transact a vast amount of business, both in civil and in criminal cases, and form a very important part of the legal system.

Probate Courts. Each probate court is also a separate court. It is a county court. Its principal function is to supervise the settlement of estates, determine the validity of wills, ascertain who are the heirs, and protect the rights of creditors and heirs. It also has jurisdiction to appoint guardians and conservators, and to compel a deserting husband to contribute to the support of his wife. It also has jurisdiction of divorce, the adoption of children, the change of names, and to some extent of the division of real estate owned jointly by several persons.

Land Court. This court has jurisdiction throughout the entire Commonwealth. It has a chief judge and two associate judges. They sit mostly in Boston, but have power to sit at other places.

The chief function of this court is to register the title of land. Registration consists of an official determination that the title of the petitioner is good, subject only to such incumbrances as the court's order specifies. Land Court proceedings are exceedingly helpful, as they serve to eliminate a great many questions which might cast doubt on the validity of a title, but which, after the consideration of the Land Court and its decree, are settled.

FEDERAL COURTS

Among the matters to which the judicial power of the national government extends are cases arising under the Federal Constitution and laws or under treaties; cases affecting ambassadors; cases of maritime nature; controversies between states or between citizens of different states; especially cases arising under the Federal Tax, Bankruptcy and Patent Laws. Many matters arising in Massachusetts are heard in the United States District Court for the District of Massachusetts. Questions of law may be carried by appeal to the Circuit Court of Appeals, in which three judges sit. Some cases are finally reviewed by the United States Supreme Court, consisting of nine Justices. The Supreme Court has jurisdiction, not only over certain appeals from the Federal Courts, but also over appeals from decisions by the Supreme Courts of the States, when there is claim that the state court decision violates rights guaranteed to citizens by the United States Constitution.

THE ORDINARY COURSE OF A LAWSUIT

The attorney for the plaintiff prepares a writ, naming as damages a figure large enough to cover all the damages which his client can reasonably claim. He gives this writ to the sheriff's office.

(*Continued on next page*)

THE CASE OF THE MONTH

EDITOR'S NOTE. *Beginning with this issue, "Co-operation" will publish in this column a brief statement concerning claims or suits against the Railway which the claim department considers interesting or helpful to us all. No names will be mentioned. The intention is to tell the employees briefly, the results of some of the multitude of claims brought against the Railway in the hope that claims may be lessened in number.*

CASE 1—(Decided This Month)

SOME time ago a little boy 4½ years old was playing on the back piazza of the house where he lived. He was in the charge of his sister Annie, about thirteen years of age. Annie went up stairs to get a milk bottle and some money to do an errand. While she was gone the boy strayed out on Western avenue.

According to the testimony in the jury trial, the boy and an older companion were attempting to carry a hammock across the street. The boy companion testified, "The hammock was across the street railway track and the car started to come and ran over the hammock and (the boy) went under the car . . . both of us had hold of it . . . this was before the car came along. When the car came along I let go of the hammock but (the boy) kept hold of it and the car pulled him under. . . . When the car stopped (the boy) was under the car."

The injuries were very severe. The judge in the jury trial ruled that there was not due care on the part of the boy or his mother, nor negligence on the part of the motorman. In other words, the Railway had won its case—that undoubtedly was what the motorman, inspector and all who were present at the trial thought and they probably would never know otherwise except for this column in "Co-operation."

But listen to what happened later: The boy's case was carried to the Supreme Judicial Court, the highest court in the Commonwealth, and the judges there ruled that the trial judge was wrong and that there was evidence of the boy's care and evidence of the motorman's negligence. The boy has recovered judgment against the railway and the car-riders for $12,000 and costs.

In the opinion of the court, and we must remember that they were impartial judges, the jury could have found that the motorman was negligent. The supreme court says: "There was evidence of the negligence of the motorman. There was no traffic in front of the car, nothing apparently to obstruct his view. He could have seen the plaintiff," etc.

THE LESSON

The amount which the Railway must pay (both of the little boy's legs were amputated) and the fact that in the opinion of some of us the care used by the little boy and his mother was not what it should be, only emphasize the fact that a motorman must watch out unceasingly for a situation like this, or similar ones, and take no chances of injuring persons in the highways. Such a situation calls for the sound judgment and quick action of the motorman—and "Co-operation" appreciates what these men are up against.

ADMINISTRATION OF THE LAW

(*Continued from page 187*)

If the defendant owns any real estate and the plaintiff desires to attach it, the deputy sheriff files a copy of the writ in the Registry of Deeds for the County, together with the deputy's certificate thereon that he has attached all the real estate of the defendant in that county. The Register of Deeds makes a record of the attachment, so that, if the defendant tries to sell any of his real estate, the buyer's attorney will see that the land is subject to the attachment. On the return day of the writ, the plaintiff's attorney files it in court with the "Declaration,"—a concise statement of the facts. If the suit is in the Superior Court, the defendant then has 21 days within which his attorney can file an answer in court—in a district court two days.

In many cases, for example when land has been taken by public authority for a public purpose and the owner is seeking compensation, the court may, at the beginning of the trial, permit the jury to "take a view" of the premises. On such a visit, each attorney can call the jury's attention to any specific objects or conditions.

At the trial, the plaintiff's witnesses of course testify first, but the plaintiff's attorney has the privilege of arguing last to the jury. The judge, in his charge to the jury, lays down the rules of law by which they must govern themselves in arriving at a decision. The attorneys formulate their claims as to the applicable rules of law in the shape of "requests for rulings," which they submit to the judge. In so far as the judge declines to adopt these requested rulings, the attorneys may "save exceptions," which later may form the basis of an appeal to the Supreme Court of the State.

On appeal, if the Supreme Court thinks the trial judge stated the law to the jury inaccurately, it may order a new trial.

If the final judgment in the case is in favor of the plaintiff, he receives from the Clerk of Court an execution, this being an order authorizing the sheriff to realize the amount of the judgment out of the goods and estate of the defendant. Certain property of a debtor, however, is exempt from seizure on execution,—including household furniture up to three hundred dollars in value, tools necessary for carrying on a trade, up to one hundred dollars in value, etc., also including a dwelling-house property up to eight hundred dollars in value, provided an estate of *homestead* in such property has been duly claimed by the owner by a writing recorded in the Registry of Deeds, but this estate is liable to seizure for some purposes, for example, for taxes and for debts incurred before the homestead estate was established.

In many civil cases, the parties dispense with trial by jury, and the judge makes findings of fact as well as rulings of law, and enters the verdict. In the municipal and district courts there are no juries; but if a defendant desires a jury trial, he may cause the case to be removed to the Superior Court.

TRUSTEE PROCESS

This is a common form of attachment, a convenient and effective way of collecting a bill. A creditor has in some circumstances the right to attach, by this method, any money that is owed to his debtor,—for example, wages. But wages are exemept from attachment, up to twenty dollars due at the time of the attachment, unless the claim sued on is for "necessaries,"—for example, groceries,—in which event the exemption is only ten dollars.

SMALL CLAIMS PROCEDURE

In the interests of speedy and inexpensive justice, it is now possible for small claims, not exceeding $35 in amount, to be collected expeditiously in many instances in a District Court without the intervention of lawyers or the formalities which are customary and necessary in more important litigation. A workman, for instance, whose employer has left him high and dry, owing him less than the amount mentioned, can have the employer summarily notified of the claim by the Clerk of Court, and the whole matter can in many instances be summarily disposed of. The defendant, however, if he files an affidavit that there are questions of fact requiring trial, and files a bond to pay "costs" if the case goes against him, may remove the case to the Superior Court.

SUGGESTIONS FOR HEALTH AT THIS SEASON

By DR. BENJAMIN E. SIBLEY

1. Do not sit or stand near anyone sneezing or coughing.
2. Whenever you sneeze or cough hold a handkerchief close to your face.
3. Do not put your fingers or any object in your mouth.
4. Wash your hands carefully before eating anything.
5. Drink plenty of water and keep your bowels active.
6. Do not drink from a cup used by others.
7. Get a good rest every night, and sleep with windows open.
8. If you "catch cold," see a doctor promptly.

THE FOUR C'S OF A SUCCESSFUL NEW YEAR

On the front cover of this last issue of "Co-operation" for the year 1928 are given four words which were stated by Mr. E. K. Hall, vice-president American Telephone and Telegraph Company, as the "4 C's" of good employer-employee relations. Mr. Hall mentioned these four C's in an address before the National Industrial Conference Board on Nov. 15, 1928. Good relations cannot be maintained without *contact* of the persons concerned. Such contact results in *conference*, through which comes *confidence*. The ultimate result is *co-operation*. Mr. Hall has put into form easy to remember a truth with the force of which all will agree in theory at least. The job for 1929 on the "El" is to make the theory work in a practical way.

BIRD MEMORIES

(With apologies to the Wire Dept.)

By D. H. Willett, Department of Accounts

Oh, well do I remember
A pole along the line,
Where the birds they used to perch and sing
"In the good old summer time."

And an old crow from the meadow
Used to come and sit and caw,
On the feed wire that the lineman strung,
With something in his claw.

How the robin and the blue jay
Would sometimes sit and rest,
And watch the agile sparrow
On the crossarm build his nest.

And when the summer days were gone
With the season growing late,
The swallows they would come and perch,
In the numbers that were great.

So I've figured out the problem quite,
Of this motley feathered throng,
They in number, like the feed wire,
Were five hundred thousand strong.

EDUCATIONAL CALENDAR FOR JANUARY

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1 New Year's Day	2 Transportation Group Conferences Col. W. V. Bingham, Speaker	3 Law for Everybody H. S. MacPherson, Esq., Speaker Arts and Crafts	4 1st-Year Foreman Conferences	5
6	7 4th-Year Foreman Conferences Public Speaking	8 Maintenance Group Conference Robert Moulton, Speaker Correct English	9 Selling Car Rides	10 Motor Vehicles Arts and Crafts	11 2nd-Year /Foreman Conferences E. Grosvenor Plowman, Leader	12
13	14 3rd-Year Foreman Conferences Public Speaking	15 Correct English	16 Open for Supervisors' Association	17 Law for Everybody John W. Cronin, Esq., Speaker Arts and Crafts	18 1st-Year Foreman Conferences	19
20	21 4th-Year Foreman Conferences Public Speaking	22 R. S. & S. Group Conference Correct English	23 Selling Car Rides	24 Motor Vehicles	25 2nd-Year Foreman Conferences Home Nursing and First Aid	26
27	28 3rd-Year Foreman Conferences Public Speaking	29 Correct English	30 Transportation Group Conferences	31 Law for Everybody C. S. Walkup, Esq., Speaker		

SUPERVISORS HOLD RECORD MEETING

What was probably the best meeting of the Boston Elevated Supervisors' Association yet held was that of Dec. 19, when an audience of 300, more or less, gathered to hear an address by Capt. Alonzo R. Williams, vice-president and general manager United Electric Railways, of Providence, R. I. Captain Williams spoke on the relations between the management and the supervisory forces, and illustrated his remarks with incidents from his experience in his present position.

Success in the operation of an organization, said Mr. Williams, depends upon confidence and absence of secrecy. A good figure to remember is the equilateral triangle, with the three sides respectively representing the employees, the owners and the public. The corners of the triangle must be firmly closed or there is no triangle. And any side of this triangle will serve as the base.

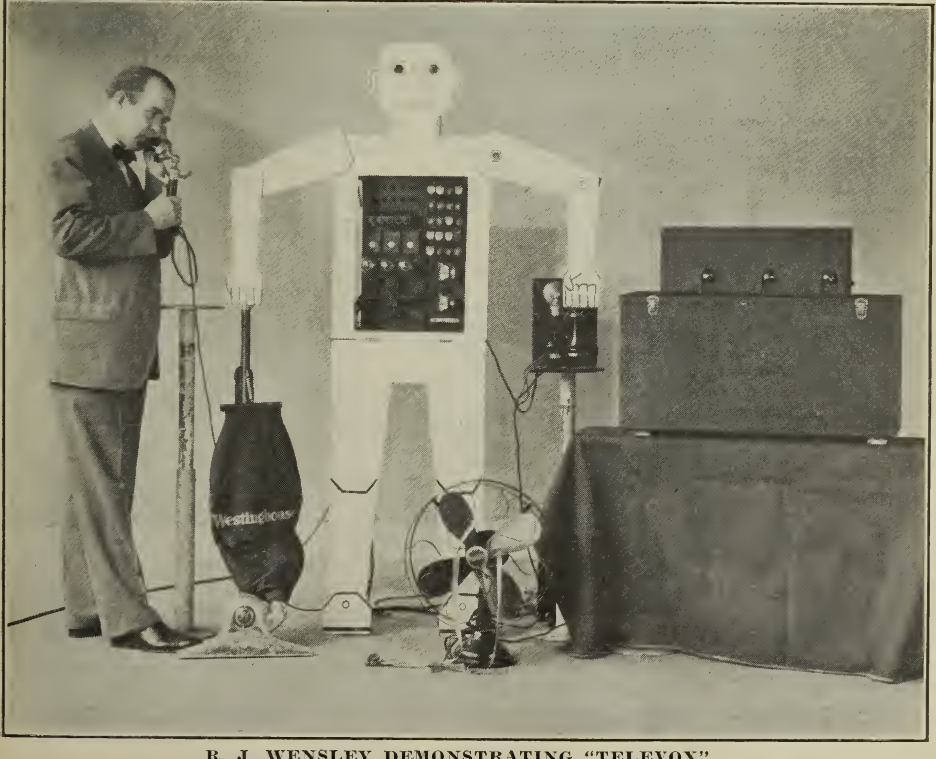
During the meeting music was furnished by an orchestra led by W. E. Benson, of the Everett shops, and an excellent vaudeville program of an hour's length followed Captain Williams' address. President Maw announced that the next meeting will be held on Wednesday, Jan. 16, 1929, when it is hoped the speaker will be Edward Dana, general manager of the Railway, who is keenly interested in the success of the Supervisors' Association.

TELEVOX AT "EL" MEETING

On December 12, at the second group conference of the rolling stock and shops department conference, A. A. Ordway presiding, R. J. Wensley, of the Westinghouse Electric and Manufacturing Company, explained and demonstrated his invention popularly known as "Televox." The accompanying illustration shows the set-up of the apparatus for demonstrating how electrical equipment can be controlled by voice currents over telephone wires.

The semblance of a man is given to the set-up merely to make it more interesting. The real "Televox" is an ingenious scientific application of electrical relays which are operated by musical tones (three at present) transmitted over ordinary telephone circuits. These relays, in turn, operate electric switches which control devices such as those illustrated. The principle is capable of wide application.

At this conference, attended by 350 people, another attraction was music by a new group of players assembled and led by Mr. Benson, as explained in the opposite column. A popular Hal Roach comedy film closed the program.



R. J. WENSLEY DEMONSTRATING "TELEVOX"

CHANGES IN THE RESERVE FUND

Fiscal Year 1927-28

July 1, 1927, $1,000,000

July	$353,208.21*	Jan.	$191,381.71†
Aug.	408,570.65*	Feb.	75,469.39†
Sept.	147,204.65*	Mar.	159,985.97†
Oct.	79,421.50†	April	43,542.45†
Nov.	34,226.52†	May	93,645.42†
Dec.	280,536.75†	June	179,790.77†

Profit and loss credit.....$666,500.98

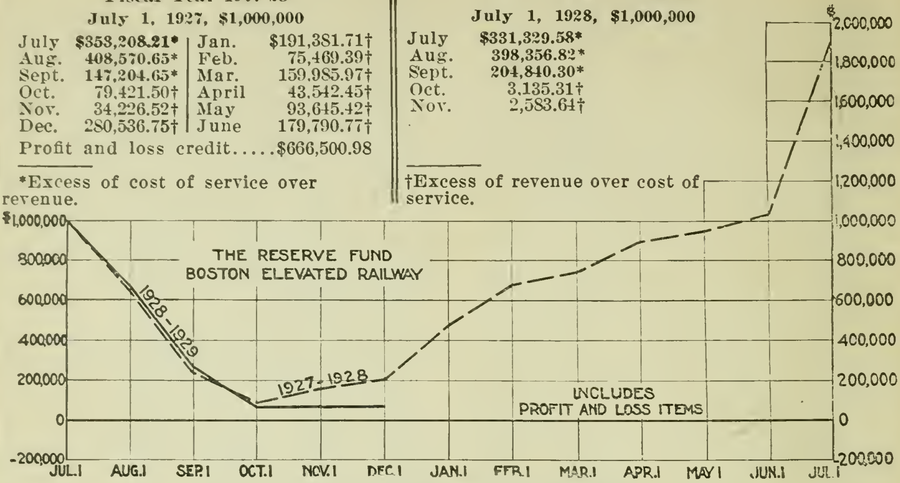
*Excess of cost of service over revenue.

Fiscal Year 1928-29

July 1, 1928, $1,000,000

July	$331,329.58*
Aug.	398,356.82*
Sept.	204,840.30*
Oct.	3,135.31†
Nov.	2,583.64†

†Excess of revenue over cost of service.



NOVEMBER OPERATION

	1928	1927
GENERAL FINANCIAL DATA		
Revenue exceeded cost of service	$2,583.64	$34,226.52
Operating revenue per car-hour (A.E.R.A. std.)	$6.24	$6.22
Operating revenue per car-mile operated	61.29c	61.52c
Average fare per revenue passenger	9.30c	9.29c
Ratio operating expense to operating revenue	71.09%	70.82%
PASSENGERS CARRIED		
Revenue passengers	30,502,444	30,745,503
Per cent 5c and 6¼c passengers	17.84%	18.04%
Revenue passengers per car-mile operated	6.385	6.409
OPERATING FACTS		
Trips operated	603,977	606,609
Car-miles operated:		
Rapid-transit lines	1,476,860	1,395,203
Surface, two-man	1,430,236	1,689,532
Surface, one-man	1,343,830	1,256,871
Express, newspaper and sprinkler cars	308	....
Motor bus	525.499	455,195
Total miles operated	4,776,733	4,796,801
ACCIDENT DATA		
Accidents per 10,000 car-miles	1.86*	2.14*
Accidents per 10,000 bus-miles	1.87*	2.77*
Revenue passengers carried per accident	18,750	16,950
Average number of witnesses per accident	3.4	3.5
COMPLAINTS AND DEFECTS		
Complaints in regard to car service	50	22
Employees complained of by car riders	121	100
Car defects reported per 10,000 car-miles	4.3	4.6
INFORMATION ABOUT POWER		
D. c. kw.-hr. output gross for month	22,155,675	20,662,505
Maximum kw. load	80,705	75,020
Tons of coal consumed for power	17,671	17,310
Lbs. of coal for power per d.c. kw.-hr. at cars	1.791	1.882
Operating and maintenance cost of power, including depreciation:		
Per d.c. kw.-hr. for car service	0.88c	0.96c
Per revenue car-mile	4.23c	4.16c
Kw.-hr. per revenue car-mile	4.796	4.341

*Does not include miscellaneous accidents or derailments.

December 20, 1928 81 EDWARD DANA, *General Manager.*